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UNITED STATES DEPARTMENT OF AGRICULTURE
BULLETIN No. 943
Contribution from the Office of Farm Management and Farm Economics
H. C. TAYLOR, Chief

Washington, D. C. ▼ April 30, 1921

COST OF PRODUCING WHEAT

ON 481 FARMS IN THE STATES OF NORTH AND SOUTH DAKOTA, MINNESOTA, KANSAS, NEBRASKA, AND MISSOURI, FOR THE CROP YEAR 1919

By

M. R. COOPER and R. S. WASHBURN
Assistant Farm Economists

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A PROBLEM OFTEN MISUNDERSTOOD.

"Cost of production" is a term which has been much used in recent years, often, it is believed, without a full comprehension of its significance. Some who had at first assumed that there was such a thing as one definite and specific cost figure for each of the staple farm products have become somewhat confused upon learning of the wide range of costs on different farms, and may have come even to doubt the utility of cost studies. It is rather difficult to arrive at a figure which properly represents the cost of producing wheat, or any other product, even on a given farm; furthermore, it is no simple matter to interpret properly the results. Because a task is difficult, however, is no reason for giving it up when the end in view is so important as in this case.

Note.—Acknowledgment is due to Messrs. M. A. Crosby and G. H. Miller, of the Office of Farm Management and Farm Economics, United States Department of Agriculture, for assistance in collecting the data which are presented in this bulletin. Acknowledgment is also due Miss Catherine R. Hawley, of the Office of Farm Management and Farm Economics, for excellent work in supervising the tabulation of the data which are used as a basis for this discussion. Thanks are extended to the numerous farmers who so willingly furnished information with reference to the cost of wheat production; also to the county agents and business men of the respective districts who so cordially assisted the enumerators in their work.

When it was shown that cost studies invariably bring out a wide range of costs instead of a single definite cost figure, the average was suggested as the representative cost figure, and often so used. Continued studies of the cost of producing farm products have indicated, however, that the average does not serve the purpose. It has been found that if prices merely equaled the average cost there would result anything but an inspiring standard, since the average usually tends to divide the producers into two groups of about equal size, one of which is producing at a cost above the average and the other at a cost below the average.

To be of any great significance, cost figures must be presented in terms of the ranges that exist in the final cost per unit of product and in the various elements of cost. The variations in the cost per unit of product in any representative farming area are so marked that they should be considered in any use of cost figures.

The Office of Farm Management and Farm Economics aims to present cost figures so that a complete picture of the range of individual costs can be obtained at a glance. From the presentation of the range of costs of farm products, it would appear that usually from 40 to 50 per cent of the production is at costs above the average. For this reason it is believed that, in order to stimulate adequate production through a period of years, the price at which the crop is sold will need to be appreciably above the average cost. It follows that the cost that will cover the "bulk" of the production of a given product is the figure that approximates what the price should be to maintain the industry. This consideration has led to the development of the "bulk-line" theory, which has recently assumed an important place in the discussion of the relation of production costs to price. The "bulk-line" theory is a modification and an attempt at practical application of the "marginal cost" or "greatest cost" theory of the relation of cost and price. In practice, the "bulk line" has sometimes been drawn to include 85 per cent of the production, but this is merely a tentative and more or less arbitrary figure. In reality the position of the "bulk line" varies with different commodities and from time to time, according to the alertness with which farmers adjust their production to market conditions. The "bulk-line" cost corresponds to the long-time average price which is essential, one year with another, to stimulate the production of that quantity of product which the market demands. What this "bulk-line" cost will be depends upon a number of factors, including the rate the farmer must pay for land, labor, and capital, and the standard of living which farmers, as a class, insist upon if they are to remain on the farm.

APPLICATION OF COST DATA TO FARM ORGANIZATION.

The farmer is primarily interested in the total net profit from his farm as a unit. The determination of the best possible combination of enterprises that provides the proper balance in the use of land, labor, and capital is a constant problem with him. Complete cost studies aid in analyzing seasonal demands for labor and capital and provide basic data of great value in planning farm reorganization.

The wide range in the costs computed for the wheat farms covered in this study suggests that considerable variation must have existed in the profits from producing wheat. It is not an easy matter to overcome the handicap that may be imposed by unfavorable weather or by certain diseases, or, perchance, by insect enemies. These are risks that demand the constant attention of the grower. Partly because of these risks, the progressive wheat farmer is intensely interested in the development of methods which will reduce his costs per unit of product and increase his profits.

SUMMARY OF RESULTS.

(197 spring-wheat records, 284 winter-wheat records.)

Cost per acre:
- Spring wheat, $12.98 to $47.84; average, $22.40.
- Winter wheat, $10.55 to $50.23; average, $27.80.

Cost per bushel:
- Spring wheat, $1.15 to $14.38; average, $2.65.
- Winter wheat, $0.96 to $8.24; average, $1.87.

Yield:
- Spring wheat, 20.8 bushels per acre to less than 1 bushel; average, 8.4.
- Winter wheat, 30 bushels per acre to 2.2; average, 14.9.

In the spring-wheat area about 33 per cent of the production was on the farms having costs above the average; in the winter-wheat area about 40 per cent of the production was on farms having costs above the average.

A study of production costs on several farms will provide many suggestions with respect to practices that are more economical than the customary methods on the majority of farms in the community. Detailed analysis brings striking illustrations into the foreground. When a better plan or a more economical practice is displayed, farmers in general will appropriate the idea and will profit thereby.

Costs not only differ on different farms during the same crop season, but they also exhibit a considerable range on any individual farm from year to year. The variations on the same farm from year to year may be due in part to weather conditions or other crop risks, or they may reflect the management of the operator. Even the most successful wheat grower may have an "off year" in wheat production, when the enterprise must be counted as a loss. Such a man would not suffer such losses annually for several years in succession without considering a change to a more profitable enterprise. There are men, however, who do continue in the business and who do sustain losses from year to year in growing wheat. Others just beginning farming may sustain losses in their initial crop seasons.

Thus in any year a considerable percentage of the producers of a given crop have costs which are above the price which is essential to stimulate adequate production through a series of years. Obviously the growers who habitually sustain losses must improve their methods, introduce more profitable enterprises, or take up other lines of business in which they may prove more efficient.

BASIC FACTORS AND COST ESTIMATES.

The basic acre-cost factors, such as hours of man and horse labor, amounts of manure and fertilizer applied, and quantities of seed and twine used, constitute much better measures of cost than the relatively unstable dollar. If these factors are known, labor rates and prices of materials can be applied for any given time, with the result that a close approximation of the total cost per acre can be obtained, which in turn will make possible a close estimate of the bushel cost when the yield per acre is known.

Where a solid foundation of such basic material is accumulated, it should provide a basis for the estimating of approximate acre and bushel costs for various products at the end of each crop year, so soon as the yield is known and before the crop is marketed. Thus, with the progress of the work in this field of investigation and as the detailed figures for a series of years are tabulated, the basic cost factors become increasingly valuable, because they serve as the basis of timely estimates which can not be made with any satisfactory degree of accuracy without them.

METHOD, SCOPE, AND PURPOSE OF PRESENT STUDY.

The purpose of this bulletin is to give the farmers of the western and northern plains, and others interested, as nearly as possible a complete statement of the facts concerning cost of wheat production for the season of the survey. With this in view, the data have been tabulated and presented in the following pages to show the average cost and the variation in cost on individual farms and groups of farms in each area visited, and to indicate the more important reasons for the great variations in cost per acre and per bushel on individual farms.

The cost data were obtained from wheat growers to whom personal visits were made. Each record represents the experience of an individual farmer, the object being to learn for each farm visited, the detailed facts of production relative to all wheat land operated by the farmer during the crop year 1919.

This study is based on 481 farm records, of which 197 were obtained in five representative counties of the principal spring-wheat States, and 284 in nine counties in the leading winter-wheat States. Table I shows the districts visited and the total harvested acreage and total production on the farms visited in each district:

TABLE I.—*Distribution of cost records, spring and winter wheat, 1919.*

State and county.	Designation of area.	Number of records.	Acres harvested.	Bushels produced.
North Dakota:				
Grand Forks County	Larimore-Gilby	39	10,060	98,335
Morton County	New Salem-Hebron	39	5,840	25,835
South Dakota:				
Spink County	Redfield	39	9,500	93,862
Minnesota:				
Clay County	Moorhead	38	10,376	84,325
Traverse County	Wheaton-Graceville	42	7,071	59,690
Total spring wheat		197	42,847	362,047
Kansas:				
Ford County	Dodge City	32	9,817	130,890
Pawnee County	Larned	32	9,092	126,838
McPherson County	McPherson	35	4,652	59,034
Missouri:				
Saline County	Marshall	29	2,362	38,422
Jasper County	Carthage	30	2,949	56,730
St. Charles Co.	St. Charles	38	3,035	59,520
Nebraska:				
Phelps County	Holdredge	30	4,404	47,744
Saline County	Crete-Dorchester	35	2,008	36,334
Keith County	Ogallala	23	4,395	79,612
Total winter wheat		284	42,714	635,124

According to the Yearbook of the United States Department of Agriculture for 1919, farmers in the United States harvested 49,905,000 acres of winter wheat, yielding 731,636,000 bushels, and 23,338,000 acres of spring wheat, yielding 209,351,000 bushels.

In this survey a total area of 43,940 acres seeded to winter wheat, yielding 635,124 bushels, and a total area of 44,218 acres seeded to spring wheat, with a total production of 362,047 bushels, were used as the basis for computing costs. About equal acreages are shown for the spring and winter wheat groups, though in 1919 the winter-wheat acreage in the United States as a whole was a little more than twice as large as the spring wheat acreage.

GEOGRAPHY OF PRODUCTION.

The geographical distribution of the 1919 wheat acreage of the United States is shown by the accompanying map (fig. 1). Figure 2 shows the counties visited in each of the spring and winter wheat States in the course of this study.

The northern boundary of the Cotton Belt more or less closely coincides with the southern boundary of the Winter Wheat Belt. Likewise the northern boundary of the Winter Wheat Belt coincides with the southern boundary of the Spring Wheat Belt. Table II shows the acreage and production of spring and winter wheat in the States where records were obtained, as compared with the total production in the United States. Of the spring-wheat area in 1919 about 66 per cent was in the States of Minnesota, North Dakota, and South Dakota. Of the winter-wheat area in 1919, over 39 per cent was in the States of Kansas, Missouri, and Nebraska.

TABLE II.—*Importance of 1919 wheat acreage and production in States where records were obtained.*

Region.	Acreage.	Per cent of total acreage (U. S.).	Production.	Per cent of total production (U. S.)
SPRING WHEAT.			*Bushels.*	
North Dakota	7,770,000	33.3	53,613,000	25.6
South Dakota	3,650,000	15.7	29,200,000	14.0
Minnesota	3,950,000	16.9	36,735,000	17.5
Total	15,377,000	65.9	119,548,000	57.1
WINTER WHEAT.				
Kansas	11,594,000	23.2	150,722,000	20.6
Missouri	4,274,000	8.6	57,699,000	7.9
Nebraska	3,716,000	7.4	54,997,000	7.5
Total	19,584,000	39.2	263,418,000	36.0

During the last 70 years the center of wheat production in the United States has moved constantly from east to west. Seventy years ago New York was one of the great wheat-producing States. From New York the region of heaviest production has moved westward, through Ohio, southern Wisconsin, and northern Illinois, until now the center of production for winter wheat is in central Kansas and for spring wheat in North Dakota. In 1919 Kansas produced 16 per cent and North Dakota 5.7 per cent of all wheat grown in the United States.

The agricultural development of these western and northern plains has been largely responsible for the wheat production having kept pace with our wheat consumption. Wheat is not grown to any extent in the South, because of the warm, humid climate, which results in injury from fungus diseases, and also because of the competition with the cotton crop.

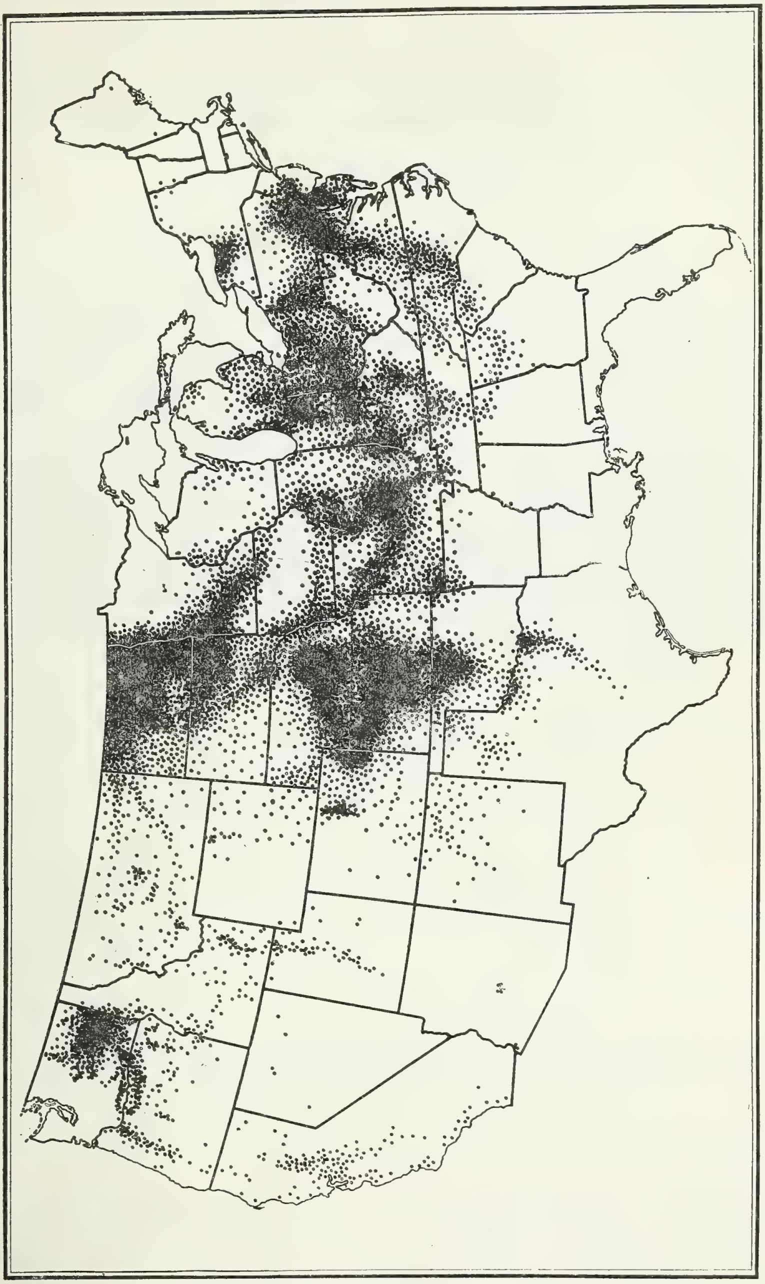

FIG. 1.—Wheat acreage, United States, 1919. Each dot represents 5,000 acrea.

CROPS GROWN IN AREAS SURVEYED.

Table III shows the percentages of the total crop acreage devoted to the various crops grown in the regions of the survey. Of all the crops grown, wheat occupies first place. (See fig. 3.) The percentage of the total acreage devoted to wheat ranges from 39 per cent in Saline County, Nebraska, to about 80 per cent in Ford County, Kansas.

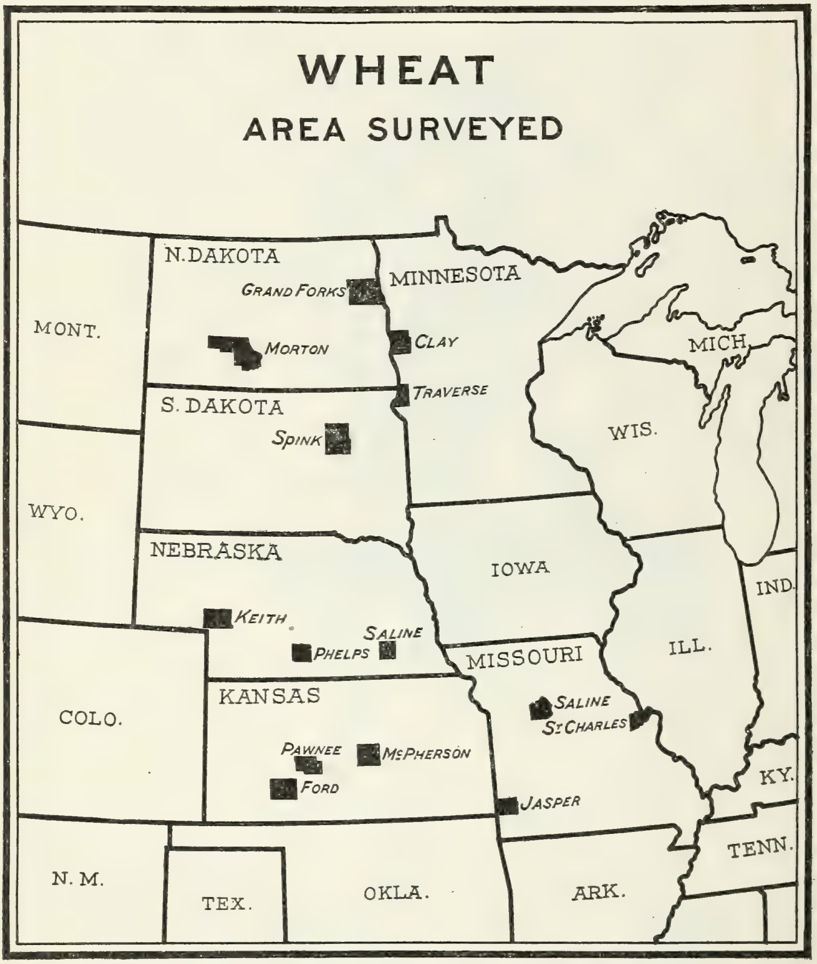

FIG. 2.—Black areas indicate the counties where wheat records were obtained.

The percentage of total acreage devoted to wheat in Missouri and Nebraska was considerably lower than in some other districts visited because of the competition with corn in these States. In the spring-wheat districts, because of the smaller amount of rainfall and the shorter growing season, corn does not compete with wheat to so great an extent.

The oat acreage was fairly well distributed in all districts, with a slightly larger acreage per farm in the spring-wheat districts. This is to be expected, since oats require a cool climate. Barley was found in all districts visited, except Missouri, but, like oats, was more generally grown in the spring-wheat districts.

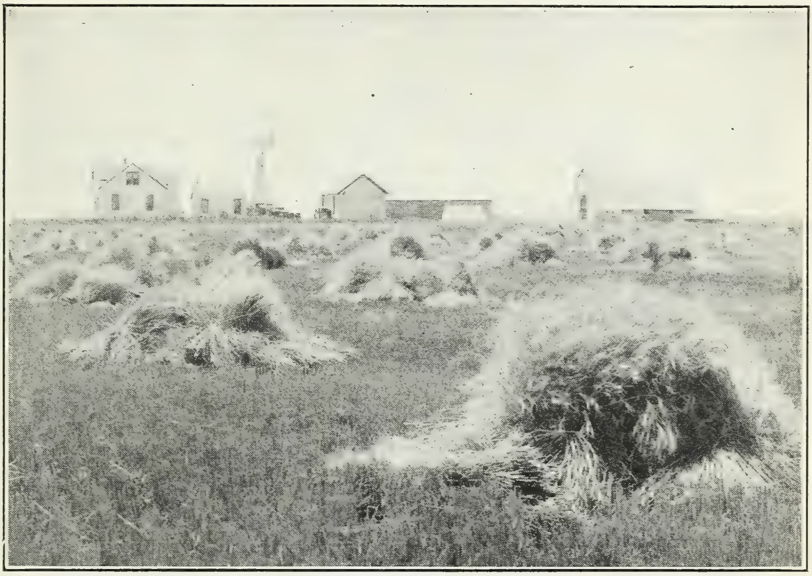

FIG. 3.—Typicalfarm scene in western Nebraska, where wheat is the leading farm crop.

TABLE III.—*Distribution of crop area, 1919 (481 farms).*

State and county.	Crop acres per farm.	Per cent of crop area in —									
		Wheat.	Corn.	Oats.	Barley.	Rye.	Hay and alfalfa.	Summer fallow.	Sorghum.	Flax.	Miscellaneous crops.
SPRING WHEAT AREAS.											
North Dakota:											
Grand Forks County	573.4	49.0	3.1	12.1	7.5	2.9	10.3	4.0	......	3.4	7.7
Morton County	409.2	39.6	2.5	6.7	4.3	8.3	21.4	5.4	......	4.2	7.6
South Dakota:											
Spink County	437.7	55.7	16.9	6.8	5.3	1.0	12.2	......	......	......	2.1
Minnesota:											
Clay County	496.0	55.1	5.4	10.4	5.8	.7	8.1	3.4	......	1.3	9.8
Traverse County	374.5	45.1	13.4	16.3	6.9	1.3	11.2	1.2	......	2.4	2.2
WINTER WHEAT AREAS.											
Kansas:											
Ford County	398.7	79.7	3.8	5.1	1.9	......	2.0	......	6.1	......	1.4
Pawnee County	384.2	75.5	8.4	.9	1.2	.9	3.5	......	4.6	......	5.0
McPherson County	204.8	69.6	10.6	4.3	.1	2.2	10.3	......	1.6	......	1.3
Missouri:											
Saline County	181.5	47.9	40.5	3.7	......	......	5.6	......	......	......	2.3
Jasper County	155.4	63.5	16.2	14.0	......	......	2.8	......	......	......	3.5
St. Charles County	130.1	61.4	25.9	4.6	......	......	7.0	......	......	......	1.1
Nebraska:											
Phelps County	271.4	56.2	28.6	2.4	3.8	.8	5.2	......	2.3	......	.7
Saline County	149.9	38.7	32.8	11.0	2.0	.1	12.4	......	.4	......	2.6
Keith County	420.0	52.1	23.1	2.9	2.6	8.0	8.4	......	1.1	......	1.8

No summer-fallow land was found in the winter-wheat districts, and in the spring-wheat areas only a small percentage of the crop area was summer-fallowed.

The area devoted to flax production was also limited.

The miscellaneous crops consisted principally of potatoes, millet, spelt, and clover and timothy seed.

CLIMATE.

Although wheat is grown in localities in the United States having widely different climates, it is a cool-weather crop, and produces the largest yield of best quality where cool, moderately wet weather prevails during the growing season and dry, sunny weather during the ripening period. Wheat is not generally a safe crop where the mean annual precipitation is less than 15 inches. In the districts of densest production (North Dakota and Kansas) the annual precipitation ranges from 18 to 32 inches. Where the rainfall exceeds 45 inches a year wheat does not thrive, principally because rust and fungus diseases are more prevalent there than in less humid districts.

The distribution of the rainfall is as important as the total amount. For instance, in Ford County, Kans., in 1918, the total rainfall was normal, but the average yield of wheat for the county was only 3 bushels per acre. This low yield was due mainly to the small amount of rainfall during the months of April, May, and June; in June it was only one-fourth inch; and for the three months but 4.5 inches, as compared with a normal rainfall of about 8 inches for these months.

Table IV shows the average yearly precipitation for all districts visited, as compared with the total rainfall for the year 1919:

Table IV.—*Mean annual rainfall for districts visited.*

Region.	Weather station.	Annual average.		1919
SPRING WHEAT.				
North Dakota:			*Inches.*	*Inches.*
Grand Forks County	Larimore	From 1910 to 1918	20.20	25.32
Morton County	New Salem	From 1909 to 1918	17.87	13.68
South Dakota:				
Spink County	Melette	From 1892 to 1918	20.64	21.41
Minnesota:				
Clay County	Moorhead	From 1881 to 1918	23.65	23.75
Traverse County	Wheaton	From 1915 to 1918	18.47	21.18
WINTER WHEAT.				
Kansas:				
Ford County	Dodge City	From 1896 to 1918	20.32	13.70
Pawnee County	Larned	From 1860 to 1918	22.70	19.88
McPherson County	McPherson	From 1889 to 1918	31.16	31.46
Missouri:				
Saline County	Marshall	From 1890 to 1918	38.63	36.12
Jasper County	Joplin	From 1878 to 1914 [a]	41.26	
St. Charles County	St. Charles	From 1890 to 1918	36.68	35.11
Nebraska:				
Phelps County	Holdredge	From 1891 to 1918	24.84	25.83
Saline County	Crete	From 1880 to 1918	28.85	33.42
Keith County	Lodgepole	From 1890 to 1918	16.62	18.95

[a] No record taken after 1914.

Over a series of years approximately one-half of the annual precipitation in all districts occurred during the four months, April, May, June, and July. The lowest annual precipitation was recorded in Keith County, Nebr. (16.62 inches), and the highest in Jasper County, Mo. (41.26 inches).

In Ford County, Kans., and Morton County, N. Dak., the rainfall in 1919 was considerably below normal. In Ford County the distribution during the growing season was sufficient to insure a fairly good yield. However, in Morton County the rainfall was not well enough distributed to produce an average yield.

SOILS.

Wheat was grown in the regions visited on fairly deep limestone soils, generally well supplied with humus. The lime content was especially high in Ford County, Kans., Keith County, Nebr., and Morton County, N. Dak., where the amount of rainfall is limited and the soluble material has not been leached out. In general, little wheat was grown on sandy soils, since this soil type is not so well adapted to wheat growing because of its tendency to blow during high winds.

On these soils no commercial fertilizer was used except in the Missouri areas.

COMPARATIVE WHEAT YIELDS.

The yield of farm crops in any given region is influenced by a number of things, such as soil fertility, weather, insect and fungus diseases, crop management, etc. Therefore, the results of any attempt to tabulate yields for a single year must be considered as suggestive rather than definite and conclusive. Yet when yields are tabulated over a series of years an average yield can be arrived at which will be of value in measuring the possibilities of the area for a given crop grown in that region.

In Table V the average wheat yields for the State, county, and farms visited in 1919 are recorded. In some cases the figures on yield were obtained from the Bureau of Crop Estimates, United States Department of Agriculture; in others, from State boards of agriculture.

The average yield of spring wheat in the United States in 1919 was 9 bushels per acre, in contrast with a yield of 8.4 bushels per acre for the total spring wheat area surveyed. The average yield for all winter wheat in 1919 was 14.7 bushels per acre, while the average yield for the farms surveyed in this region was 14.9 bushels per acre.

The abnormally low yield of wheat in Morton County, N. Dak., was partially due to an insufficient amount of total rainfall which was not well distributed over the growing period.

In Grand Forks County, N. Dak., and in Clay and Traverse Counties, Minn., a period of moist, hot weather occurred just prior to harvest time, resulting in wheat rust, which reduced wheat yields appreciably in these counties.

It will be noted (Table V) that the largest number of farms in the spring-wheat districts are included in the group having a yield of from 5 to 10 bushels per acre, while the largest number in the winter wheat districts come within the group having a yield of from 15 to 20 bushels.

The average 1919 yield per acre for the farms included in this study was determined by dividing the total production by the total harvested acreage. The costs presented in this bulletin are based on the actual yields obtained on these farms.

TABLE V.—*Annual yields, spring and winter wheat.*

Region.	10-year State average.	9 or 10 year county average.	Average for farms visited, 1919.	Range in yield per acre.					
				Under 5 bush.	5 to 10 bush.	10 to 15 bush.	15 to 20 bush.	20 to 25 bush.	25 bush. and over.
SPRING WHEAT.				*No. of farms.*	*No. of farms.*	*No. of farms.*	*No. of farms.*	*No. of farms.*	*No of farms.*
North Dakota	10.6								
Grand Forks County		12.9	9.8	1	16	20	2		
Morton County		9.2	4.4	25	14				
South Dakota	11.3								
Spink County		10.8	9.9		24	13	2		
Minnesota	14.1								
Clay County		13.5	8.1	2	26	9	1		
Traverse County		11.8	8.4	1	32	9			
Total spring wheat				29	112	51	5		
Per cent of total				15	57	26	2		
WINTER WHEAT.									
Kansas	13.8								
Ford County		12.6	13.3	3	7	6	10	6	
Pawnee County		12.9	13.9	1	4	16	10	1	
McPherson County		14.7	12.7		8	17	10		
Missouri	14.3								
Saline County		15.7	16.3		3	7	12	7	
Jasper County		15.8	19.2				17	12	1
St. Charles County		15.2	19.6			2	12	22	2
Nebraska	16.0								
Phelps County		14.1	10.8		15	13	2		
Saline County		21.1	18.1			6	17	12	
Keith County		19.5	18.1		2	2	11	5	3
Total winter wheat				4	39	69	101	65	6
Per cent of total				1	14	24	36	23	2

REQUIREMENTS OF PRODUCTION.

In arriving at the cost of wheat production the following elements of cost have been considered:

Labor, which includes (1) all direct man and horse farm labor, and (2) contract labor, including such items as marketing wheat at a fixed charge per bushel and various labor operations in growing the wheat crop, where done at a contract rate per acre.

Materials, including seed wheat (with cost of treating seed); barnyard manure and straw, fertilizer and twine.

Thrashing, which includes (1) cash paid per bushel, (2) board for the part of thrashing crew furnished by the thrasherman, and (3) any thrashing fuel furnished by the farmer.

Use cost of land, or land rent, which includes (1) interest on wheat land investment for owned farms, (2) the market value of the share of wheat given at thrashing time to the landlord as rent, and (3) the actual cash paid for cash-rented wheat land.

Other costs, including (1) farm taxes and insurance; (2) special crop insurance, (3) use of tractor and other farm machinery; (4) loss due to abandoned wheat acreage; and (5) overhead.

Credits, including (1) straw, (2) pasture, and (3) insurance received for damages to the growing wheat crop.

SUMMARY OF COSTS, BY DISTRICTS.

In Tables VI and VII is presented a summary of average cost per acre and per bushel for the areas surveyed. This enables a comparison of the total costs of production by districts, and the part of the total costs that is chargeable to labor, materials, thrashing, use of land, and other costs.

TABLE VI.—*Summary of average cost per acre and per bushel of spring wheat, 1919 (197 farms).*

Item.	North Dakota.		South Dakota.	Minnesota.		All spring wheat.	Per cent of total cost.
	Grand Forks County.	Morton County.	Spink County.	Clay County.	Traverse County.		
Number of records	39	39	39	38	42	197	....
Total acres	10,060	5,840	9,500	10,376	7,071	42,847	....
Total production (bushels)	98,335	25,835	93,862	84,325	59,690	362,047	....
Average yield per acre (bushels)	9.8	4.4	9.9	8.1	8.4	8.4	....
Labor (land preparation and seeding)	....	....	....	....	....	....	18.0
Man labor cost per acre	$1.24	$1.69	$1.16	$1.29	$1.40	$1.32	....
Horse labor cost	2.77	3.34	2.54	2.35	3.17	2.76	....
Contract labor	.10	....	.01	.01	....	.03	....
Labor (harvesting, marketing)	....	....	....	....	....	....	14.4
Man labor cost	1.29	2.20	2.00	2.26	2.72	2.04	....
Horse labor cost	.88	1.18	1.02	1.36	1.58	1.18	....
Contract labor	.01	.06	.06	.02	.03	.04	....
Material costs	....	....	....	....	....	....	17.1
Seed and seed treatment	3.39	2.98	2.78	3.45	3.38	3.21	....
Binder twine	.57	.02	.39	.50	.46	.42	....
Manure and straw	.22	.29	.17	.40	.20	.26	....
Thrashing	2.78	.43	2.68	1.18	1.13	1.78	7.8
Use cost of land	4.22	2.15	7.58	6.16	5.98	5.44	23.9
Other costs	....	....	....	....	....	....	18.8
Taxes and insurance	.29	.21	.32	.46	.42	.35	....
Special crop insurance	.18	.21	.25	.54	.11	.28	....
Use cost of tractor	.07	.19	.26	.67	.21	.30	....
Use cost of other farm machinery	1.50	1.98	1.36	1.30	1.43	1.47	....
Loss on abandoned acreage	.97	.94	....	....	....	.36	....
Overhead	1.59	1.46	1.31	1.54	1.69	1.51	....
Total cost per acre	22.07	19.33	23.89	23.49	23.91	22.75	100.0
Credits	.19	.50	.19	.58	.30	.35	....
Net cost per acre	21.88	18.83	23.70	22.91	23.61	22.40	....
Net cost per bushel	2.24	4.26	2.40	2.82	2.80	2.65	....
Without land rent:							
Net cost per acre	17.66	16.68	16.12	16.75	17.63	16.96	....
Net cost per bushel	1.81	3.77	1.63	2.06	2.09	2.01	....

TABLE VII.—*Summary of average cost per acre and per bushel of winter wheat, 1919 (284 farms).*

Item.	Kansas.			Missouri.			Nebraska.			All winter wheat.	Per cent of total cost.
	Ford County.	Pawnee County.	McPherson County.	Saline County.	Jasper County.	St. Chas. County.	Phelps County.	Saline County.	Keith County.		
Number of records	32	32	35	29	30	38	30	35	23	284	......
Total acres	9,817	9,092	4,652	2,362	2,949	3,035	4,404	2,008	4,395	42,714	......
Total production (bushels)	130,890	126,838	59,034	38,422	56,730	59,520	47,744	36,334	79,612	635,124	......
Average yield per acre (bushels)	13.3	13.9	12.7	16.3	19.2	19.6	10.8	18.1	18.1	14.9	......
Labor (land preparation and seeding)	......	......	......	......	......	......	......	......	......	......	13.8
Man labor cost per acre	$0.93	$0.75	$1.62	$1.50	$2.21	$1.82	$1.25	$2.13	$0.83	$1.23	......
Horse labor cost	2.74	1.85	3.58	3.08	4.30	3.70	2.46	4.29	.97	2.70	......
Contract labor	.02	......	.02	.11	.02	......	......	.01	.18	.03	......
Labor (harvesting, marketing)	......	......	......	......	......	......	......	......	......	......	20.6
Man labor cost	3.75	2.80	3.89	4.78	4.68	4.89	3.61	5.77	4.61	3.94	......
Horse labor cost	2.20	1.38	1.61	1.83	2.22	1.96	1.67	2.53	1.28	1.79	......
Contract labor	.02	.02	......	.12	.20	......	......	......	1.32	.16	......
Material costs	......	......	......	......	......	......	......	......	......	......	10.4
Seed and seed treatment	1.79	2.19	2.36	2.73	2.52	2.58	2.13	2.99	1.72	2.18	......
Binder twine	.31	.21	.63	.66	.53	.55	.63	.87	.44	.45	......
Manure and straw	.06	.10	.39	.06	.44	.40	.16	.27	.02	.17	......
Green manure	......	......	......	......	......	.33	......	......	......	.02	......
Fertilizer	......	......	......	.01	2.07	.01	......	......	......	.14	......
Grasshopper poison	.02	......	......	......	......	......	.01	......	......	.01	......
Thrashing	2.58	2.67	2.83	3.37	1.45	1.86	1.18	1.98	1.91	2.30	8.0
Use cost of land	6.14	7.77	8.44	13.92	10.30	11.28	6.94	13.25	9.57	8.59	30.0
Other costs	......	......	......	......	......	......	......	......	......	......	17.2
Taxes and insurance	.13	.18	.21	.43	.24	.36	.18	.63	.12	.22	......
Special crop insurance	1.06	1.23	.27	.07	.10	.06	.63	.21	1.15	.74	......
Use cost of tractor	.12	.26	.33	.20	.19	.47	.14	.37	1.39	.35	......
Use cost of other farm machinery	1.15	1.32	1.98	1.51	1.77	2.13	1.23	1.93	1.68	1.51	......
Loss on abandoned acreage	.24	.18	.69	.91	.06	......	.32	.15	......	.26	......
Sack rent	......	......	......	.07	......	.07	......	......	......	.01	......
Overhead	1.75	1.44	2.03	2.19	2.48	2.17	1.57	2.50	1.59	1.81	......
Total cost per acre	25.01	24.35	30.88	37.55	35.78	34.64	24.11	39.88	28.78	28.62	100.0
Credits	.71	1.29	.68	2.27	1.14	.51	.27	.34	.26	.82	......
Net cost per acre	24.30	23.06	30.20	35.28	34.64	34.13	23.84	39.54	28.52	27.80	......
Net cost per bushel	1.82	1.65	2.38	2.17	1.80	1.74	2.20	2.19	1.57	1.87	......
Without land rent:											
Net cost per acre	18.16	15.29	21.76	21.36	24.34	22.85	16.90	26.29	18.95	19.21	......
Net cost per bushel	1.36	1.10	1.71	1.31	1.26	1.17	1.56	1.45	1.05	1.29	......

The gross costs are partially offset by credits for pasture and any straw utilized on the farm. The difference between the gross cost and the sum of these credits is the net cost of producing wheat. The cost per bushel was obtained by dividing the total net cost by the total yield. The average acre cost of each item of expense was computed on a weighted basis by dividing the total cost of each item by the total wheat acreage. This method results in a relatively low regional cost per acre for items of expense that did not occur on the entire acreage. As an illustration, the cost of binder twine in Morton County, N. Dak., where but 10 per cent of the acreage was cut with a binder, amounted to but 2 cents per acre when distributed over the total wheat acreage.

Again, in Keith County, Nebr., less than 1 per cent of the wheat acreage was manured at a prorated cost of 2 cents per acre. Such averages, of course, have no direct significance to the grower, though they may have weight in determining a regional cost.

An analysis of the total cost for spring and winter wheat under the five headings, "labor," "materials," "thrashing," "use cost of land," and "other costs," shows that labor constitutes about 32 to 35 per cent of the total cost of production; thrashing about 8 per cent; materials from 10 to 17 per cent; land rent from 24 to 30 per cent; and "other costs" from 17 to 19 per cent.

The two largest items of cost, "labor" and "land rent," constitute about 56 and 64 per cent, respectively, of the total costs in the spring and winter wheat areas. The variations in labor practices and costs are shown in detail elsewhere in this bulletin.

The average use cost of land in each district represents a combination of tenures and is not indicative of the rent charge for any particular renting practice. The land rent charge, therefore, is a composite figure, made up of the interest on land values on owned farms and the cash or share rent paid on rented farms. These variations in land values and variations in yields and in the acreage of wheat produced on owned and rented land are reflected in the differences in the average land rent charges for the various districts. Because of the lower land values and the lower yield of wheat in the Spring-Wheat Belt the charge for the use of land is considerably lower here than in the Winter-Wheat Belt.

Nearly 40 per cent of the spring wheat and 60 per cent of the winter wheat acreage in question was grown by renters. To these men the charge for the use of land is an important item of cost. To the operator who owns his land a charge for the use of land is less vital from the standpoint of actual cash outlay. The owner, however, has an investment in wheat land, which, if rented out, would return to him an income in cash or equivalent thereto in the form of a share of the wheat crop. Therefore, in determining the cost of producing wheat on owned land, interest on investment in land has been considered an item of cost in order that cost of production on owned and rented land may be comparable. The importance of the charge for use of land may be seen by referring to the last two items in Tables VI and VII, where the cost per acre and per bushel without land rent has been shown. In the case of spring wheat the charge for use of land amounted to 64 cents a bushel and in the case of winter wheat 58 cents a bushel.

In the winter wheat districts the three counties in Missouri had the most uniform cost per acre. With the exception of Saline County, Nebr., the average cost for the Missouri areas was considerably higher than the cost for the other winter-wheat areas. The principal reasons for this are found in higher land values and a more thorough preparation of the land for wheat in the three Missouri districts and in the Saline County, Nebr., area.

Since yield has a much less important influence on the cost per acre than on the cost per bushel, the acre cost should be the unit used in comparing the cost of wheat production in the districts visited. The cost of twine, shocking, thrashing, and marketing vary somewhat with yield; but, unless the yields are abnormal, this variation is so slight that the costs per acre are comparable within a region. The yield per acre, however, as already pointed out, has a decided effect on cost per bushel, as will be seen from an examination of Tables VI and VII. The average cost of producing winter wheat was $27.80 per acre and $1.87 per bushel, as compared with an average cost for spring wheat of $22.40 per acre and $2.65 per bushel. It will be seen that the average cost per acre for all spring wheat was $5.40 less than for all winter wheat, though the average cost per bushel was $0.78 greater. This difference in cost per bushel is due to a lack of relation between the cost of producing an acre of wheat and yield obtained; the *cost* per acre of winter wheat being 24 per cent greater than for spring wheat, whereas the *yield* per acre was 77 per cent greater.

RANGE IN COST PER ACRE, BY COUNTIES.

In Table VIII the farms have been grouped according to cost per acre. In the five spring-wheat counties the acre cost per farm ranged from $12.98 to $47.84. Only 7 per cent of these farms, however, had a cost in excess of $30 per acre, and the number with a cost of less than $20 per acre was of small importance in all but the two counties visited in North Dakota. In the two North Dakota areas over 78 per cent of the farms had a cost of $25 or less per acre. In Grand Forks County comparatively low labor and rent costs were found on a goodly number of farms. In Morton County the labor costs were fairly high, which was partially offset by a low thrashing cost and exceptionally low rent costs.

The wide range in acre costs within each area is explained in the following manner: As a rule, those farms showing a cost of less than $20 per acre had comparatively low labor costs, combined with a low rent charge, the latter being due to a low valuation of land on owned farms and low yields on rented farms; and since the value of the share of wheat given to the landlord for the use of the land has been charged as rent to the operator, the rent charge on rented farms varied with the yield obtained. In this connection it should be noted that a good many of the farms in each area having a cost of less than $20 per acre were share-rented farms. Again, the farms in this cost group did not have excessive costs from abandoned wheat acreage.

The next two and important groups, $20 to $25 and $25 to $30 per acre, contained farms on which there was either a gradual or irregular increase in all or a part of the various items of cost over those farms in the preceding group. These increases were most pronounced in labor and rent costs, although a few farms came within these groups because of abandoned acreage costs.

TABLE VIII.—*Range in cost per acre, by counties, spring and winter wheat, 1919 (481 farms).*

District.	Number of records.	Cost per acre.					
		Under $20 (number of farms).	$20 to $25 (number of farms).	$25 to $30 (number of farms).	$30 to $35 (number of farms).	$35 to $40 (number of farms).	$40 and over (number of farms).
SPRING WHEAT.							
North Dakota:							
Grand Forks County	39	10	18	9	1	1	....
Morton County	39	21	12	6	....	....	....
South Dakota:							
Spink County	39	5	20	12	2	....	....
Minnesota:							
Clay County	38	6	17	9	6	....	....
Traverse County	42	4	21	14	2	....	1
Total, spring wheat	197	46	88	50	11	1	1
Per cent of total	100	23	45	25	6	.5	.5
WINTER WHEAT.							
Kansas:							
Ford County	32	10	7	11	2	2	....
Pawnee County	32	4	18	9	1	....	....
McPherson County	35	....	7	12	11	3	2
Missouri:							
Saline County	29	....	2	1	10	8	8
Jasper County	30	....	....	3	17	6	4
St. Charles County	38	....	....	5	16	11	6
Nebraska:							
Phelps County	30	5	15	9	1	....	....
Saline County	35	....	....	1	3	16	15
Keith County	23	3	3	8	4	3	2
Total, winter wheat	284	22	52	59	65	49	37
Per cent of total	100	8	18	21	23	17	13

The farms in the three highest cost groups had one or more excessive items of cost. Thus in the Grand Forks area the farm having a cost of $30 to $35 per acre was a rented farm with a yield of 12 bushels per acre based on the acres harvested, but about one-half of the acreage seeded was abandoned before harvest. In the same area the farm in the $35 to $40 class abandoned 150 out of 210 acres.

The two farms having the highest cost in Spink County came in the $30 to $35 group. One of these farms had a very high rent cost and the other a high labor and rent cost combined with a comparatively high cost for seed wheat.

The eight farms in Minnesota with costs of $30 to $35 per acre had high labor and rent costs, and the one farm in Traverse County with a cost of over $40 was a small farm highly capitalized. The labor, rent, equipment, and overhead costs were comparatively high, with a resultant cost of $47.84 per acre.

In the winter-wheat areas the variation in cost per acre on farms in the same county was due primarily to the same causes that affected costs on the spring-wheat farms. Thus in Ford County three of the four farms having a cost of $30 to $40 per acre were share-rented farms on which good yields were obtained, making a high-rent charge to the operator. The one farm with a cost of $30 to $35 per acre in Pawnee County was a share-rented farm also with a high yield. Of McPherson County's five farms appearing in the two highest cost groups three had abandoned acreage and the other two were share-rented farms with good yields. The two farms with lowest acre costs in Saline County, Mo., had comparatively low-labor costs and exceptionally high credits for straw and pasture. The farms having a cost of $40 and over per acre in the three Missouri counties had no item of expense for abandoned acreage, but were universally high in labor costs, and in some instances had high thrashing and rent costs; the latter owing to high land values or very good yields of wheat. In the Nebraska areas the variation in cost per acre was attributable to the reasons mentioned above, the principal causes of variation closely following those mentioned for the Missouri areas.

In the three Missouri areas the prominence of the farms with comparatively high acre costs is due to thorough land preparation, good yields, and high land valuations. Likewise on the farms in Saline County, Nebr., which are relatively small, much labor is devoted to land preparation, good yields were obtained, causing a fairly high thrashing charge per acre, and land valuations were higher than in any other area visited except one.

Thus it is evident that the acre cost of growing wheat is in no way constant, but may vary as the quantities and values of the various items of cost vary. The amount and the cost of labor devoted to raising an acre of wheat may be influenced by many things, some of which the farmer can not control, and in consequence the acre cost may change from year to year. This is borne out by a study of individual farm costs in each area. The amount of labor devoted to seed-bed preparation was not uniform in any given locality. This lack of uniformity was due to different practices followed on individual farms and even on different fields on the same farm. Soil conditions, weather conditions, available labor, distance from market, etc., all have much to do with the hours devoted to raising an acre of wheat.

As an example of variation in practice it was not uncommon to find farmers in certain winter-wheat areas who plowed a part of the land, listed a part, and disk-drilled a part in cornstalk or grain stubble land without further preparation. In some instances a part of the wheat land was in such condition as a result of heavy rains that an 8-foot binder was able to cut but one-third to one-half of a full swath. The influence of such conditions on labor requirements not only in cutting but in shocking such wheat is apparent The abandonment of a high percentage of the acreage has a decided effect on acre cost. Rent or interest on land, the value of which ranged from $30 to over $200 per acre in the spring-wheat areas, is also a big item in acre-cost variation, just as is high or low yields on share-rented farms. Other items of cost were less variable, but each contributed its part to the range in acre costs as shown for these farms.

Could each wheat farmer foresee the cost per acre of production, and furthermore forecast with any degree of accuracy the yield for any given year, farming as well as cost of production studies would be much simplified. But unfortunately, this is not the case, and while such information for one year is of considerable value, it is only after data of this nature have been obtained for a number of years that plans for farm organization can be undertaken with best results. These cost figures, therefore, should be treated as preliminary, representative of but one year's work. They should be supplemented by similar figures for years to come to make them applicable as fixed standards for individual farmers.

(Further variations in the cost per acre and per bushel on farms operated by landowners are shown in Table XXXVII, appendix, where an itemized statement is recorded for each farm visited.)

VARIATION IN NET COST PER ACRE.

In figures 4 and 5 the spring-wheat and winter-wheat farms have been grouped according to cost per acre, without regard to counties. In the spring-wheat area 88 of the 197 farms came within the $20 to $25 class. Next in importance were the farms with costs ranging from $25 to $30 per acre, followed closely by the group with cost under $20 per acre. Few farms had costs of over $30.

TABLE IX.—*Variation in net cost per acre, spring and winter wheat, 1919 (481 farms).*

Net cost per acre.	Number of farms.	Cumulative per cent of farms.	Seeded.	Harvested.	Cumulative per cent harvested.	Production.	Cumulative production.	Production.
SPRING WHEAT.								
		Per cent.	*Acres.*	*Acres.*	*Acres.*	*Bushels.*	*Bushels.*	*Per cent.*
Under $20	46	23.4	10,389	10,156	23.7	62,855	62,855	17.4
$20 to $25	88	68.1	22,224	21,962	75.0	196,224	259,079	71.6
$25 to $30	50	93.4	10,066	9,440	97.0	89,432	348,511	96.3
$30 to $35	11	99.0	1,278	1,178	99.8	12,618	361,129	99.8
$35 to $40	1	99.5	210	60	99.9	423	361,552	99.9
$40 and over	1	100.0	51	51	100.0	495	362,047	100.0
WINTER WHEAT.								
Under $20	22	7.8	5,468	5,193	12.2	46,437	46,437	7.3
$20 to $25	52	26.1	11,773	11,485	39.1	141,542	187,979	29.6
$25 to $30	59	46.9	10,823	10,537	63.8	160,860	348,839	54.9
$30 to $35	65	69.7	8,343	8,206	83.0	146,151	494,990	77.9
$35 to $40	49	87.0	5,044	4,924	94.5	92,508	587,498	92.5
$40 and over	37	100.0	2,489	2,369	100.0	47,626	635,124	100.0

In the winter-wheat area the farms having costs from $30 to $35 per acre were predominant, though the variation in size of groups was much less marked than that shown by the spring-wheat farms. The importance of these various groups is brought out clearly in Table IX. where the cumulative per cent of acreage harvested and cumulative per cent of production are presented.

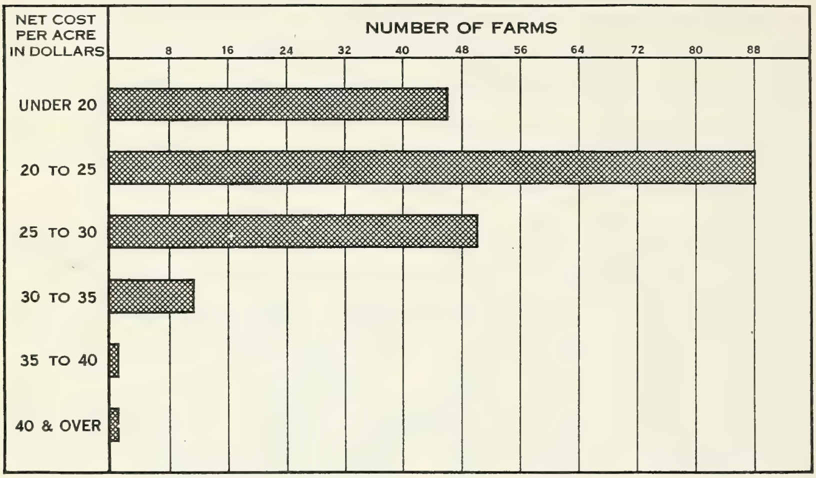

FIG. 4.—Variation in net cost per acre, spring wheat, 1919.

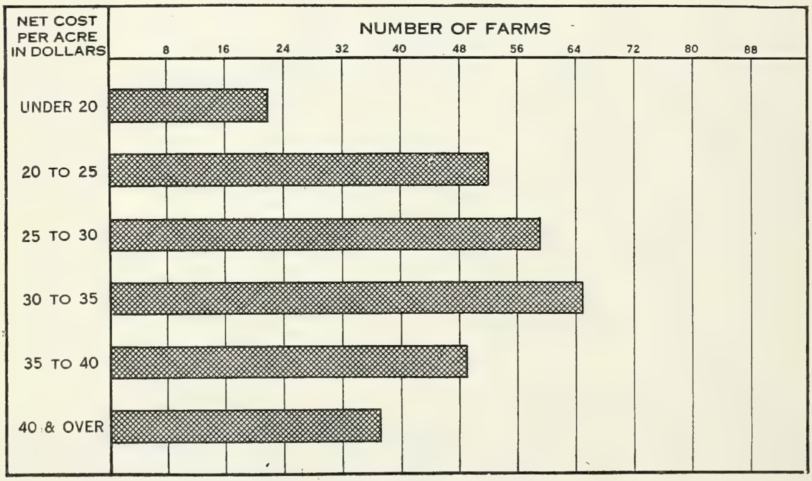

FIG. 5.—Variation in net cost per acre, winter wheat, 1919.

In the spring-wheat areas 68 per cent of the farms visited produced wheat at costs of less than $25 per acre. These farms had 75 per cent of the acreage and 72 per cent of total production.

In the winter-wheat areas the range in cost per acre was greater than in the spring-wheat areas. Nearly 70 per cent of the farmers, representing 83 per cent of the acreage and 78 per cent of total production, had costs of $35 or less per acre

NET COST PER BUSHEL.

RELATION OF YIELD TO COST PER BUSHEL.

As heretofore shown, a wide range in cost per acre existed on the farms visited. While, of course, it is advisable to produce a maximum yield at a minimum cost per acre, the ultimate result of importance is the cost of producing a bushel of wheat. If yield were to increase with fixed relation to an increase in cost per acre, a definite basis would be established for planning profitable farm organization. However, one may handle a crop according to approved methods of production only to have the crop destroyed by insects, fungus diseases, excessive droughts or rains, etc., and while the acre cost of production may be reasonable, the cost per bushel may be extremely high. The experience of wheat growers has been that if they can withstand the losses occasioned by crop failures they may hope to realize a compensating income during the good years. Were it not for a realization of these things an exceedingly bad year might induce many farmers to go out of the business.

In Tables X and XI the spring and winter wheat farms have been grouped according to yield. A review of these tables shows the influence of yield in determining cost per bushel. In general, as the yield per acre increased, the cost per bushel decreased.

TABLE X.—*Relation of yield to cost per bushel, spring wheat, 1919 (197) farms.*

Range of yield.	Number of records.	Cumulative per cent of production.	Average yield.	Average cost per bushel.	Range of yield.	Number of records.	Cumulative per cent of production.	Average yield.	Average cost per bushel.
Bushels.			*Bushels.*		*Bushels.*			*Bushels.*	
1 to 1.9	3	0.2	1.3	$12.16	10 to 10.9	11	67.0	10.3	2.30
2 to 2.9	5	.8	2.8	5.81	11 to 11.9	22	79.7	11.5	2.10
3 to 3.9	7	1.6	3.3	5.98	12 to 12.9	7	84.2	12.0	1.95
4 to 4.9	14	4.9	4.5	4.54	13 to 13.9	8	90.5	13.2	1.93
5 to 5.9	18	11.0	5.4	3.79	14 to 14.9	4	94.5	14.6	1.79
6 to 6.9	27	23.1	6.5	3.25	15 to 15.9	2	98.0	15.4	1.45
7 to 7.9	22	32.2	7.6	2.97	16 to 16.9	2	99.7	16.7	1.60
8 to 8.9	25	46.1	8.5	2.65	17 and over	1	100.0	20.8	1.15
9 to 9.9	19	55.0	9.5	2.58					

The column in these tables showing cumulative per cent of production indicates that over one-half of the wheat grown on the spring-wheat farms included in this study was produced on farms having yields of less than 10 bushels per acre, and that 45 per cent was raised on farms having yields of from 10 to 20.8 bushels per acre. In the winter-wheat areas better yields prevailed than in the spring-wheat areas. Here nearly 50 per cent of the wheat was grown on farms having yields of from 2.2 to 16.9 bushels and the other 50 per cent was grown on farms where yields of from 17 to 30 bushels per acre were obtained. When one considers the range in yields obtained on these farms, the great variations in costs per bushel are not surprising.

TABLE XI.—*Relation of yield to cost per bushel, winter wheat, 1919 (284 farms).*

Range of yield.	Number of records.	Cumulative per cent of production.	Average yield.	Average cost per bushel.	Range of yield.	Number of records.	Cumulative per cent of production.	Average yield.	Average cost per bushel.
Bushels.			*Bushels.*		*Bushels.*			*Bushels.*	
2 to 2.9	2	0.3	2.5	$6.55	15 to 15.9	21	43.3	15.4	1.90
3 to 3.9	1	.4	3.4	4.35	16 to 16.9	18	49.4	16.4	1.82
4 to 4.9	1	.6	4.9	3.60	17 to 17.9	24	59.9	17.5	1.61
5 to 5.9	3	1.1	5.6	3.37	18 to 18.9	27	70.0	18.5	1.80
6 to 6.9	3	1.5	6.4	3.42	19 to 19.9	11	73.6	19.5	1.76
7 to 7.9	7	3.3	7.5	2.89	20 to 20.9	28	82.3	20.2	1.55
8 to 8.9	14	6.5	8.2	2.47	21 to 21.9	15	89.6	21.4	1.56
9 to 9.9	12	9.1	9.6	2.39	22 to 22.9	12	94.3	22.2	1.49
10 to 10.9	14	12.1	10.5	2.26	23 to 23.9	6	96.4	23.4	1.65
11 to 11.9	12	14.5	11.3	2.17	24 to 24.9	4	98.2	24.2	1.29
12 to 12.9	12	22.3	12.4	1.97	25 to 25.9	4	99.2	25.2	1.47
13 to 13.9	13	28.5	13.4	2.06	28 to 28.9	1	99.5	28.8	1.49
14 to 14.9	18	35.4	14.5	1.97	29 and over	1	100.0	30.0	1.46

VARIATION IN NET COST PER BUSHEL.

On the 197 spring-wheat farms the average cost was $2.65 per bushel, and the cost on individual farms ranged from $1.15 to $14.38 per bushel. However, but one of the 197 farms had a cost as high as $14.38, and only 15 farms, representing 2.5 per cent of the wheat produced, had costs exceeding $5 per bushel. In figure 6 the 197 farms have been arranged according to net cost per bushel, that the relative importance of each cost group may be shown.

The variations in net cost per bushel are due, of course, to variations in costs expended per acre and in the yields obtained, both of which factors have been previously discussed. However, it may be of interest to note conditions that prevailed in 1919 on some of the farms having extremely low or high costs. A review of the records taken indicates that when the farms were classified, as shown in figure 6, both those with comparatively low and those with comparatively high acre costs often appeared in the same cost per bushel class. Yield is the most variable factor in determining the cost of producing a bushel of wheat, and this factor is therefore largely responsible for the grouping of the farms. Farms where a part of the acreage was not worth cutting usually had a high acreage cost, owing to expenses in preparing land and seeding wheat that was not cut. Furthermore the yield from the acreage harvested was usually low, thus further increasing the bushel cost. Of the farmers having a cost of $5 or over per bushel, about one-half abandoned a part of the seeded wheat acreage, and the yield on this group of farms ranged from slightly less than 1 bushel per acre to 7 bushels per acre, based on the acreage harvested. The farms having a low cost per bushel were farms on which comparatively good yields were obtained, many yielding from 10 to 15 bushels, and in some instances as high as 20 bushels per acre.

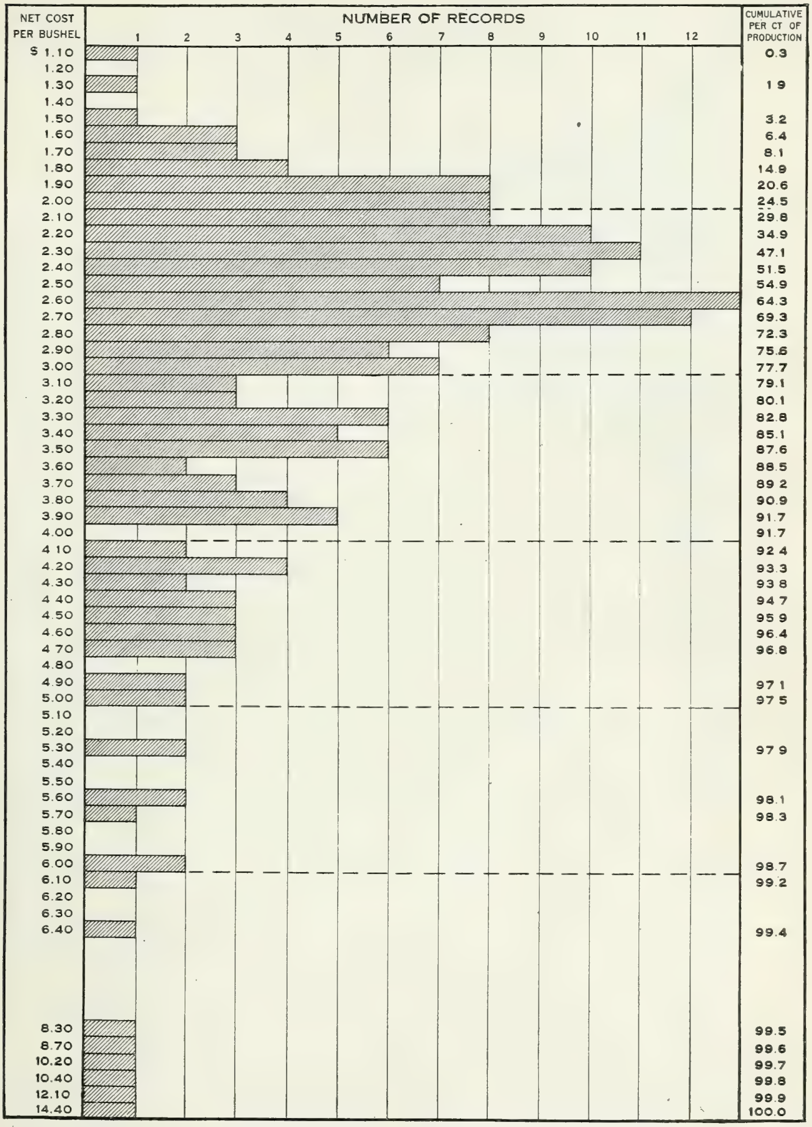

FIG. 6.—Variation in net cost per bushel, winter wheat, 1919.

The average cost for the 284 winter wheat farms was $1.87 per bushel. The range in cost on individual farms was from $0.96 to $8.24 per bushel (see fig. 7). Nearly 75 per cent of the wheat grown on these farms in 1919 was produced at a cost of $2 and less per bushel and was grown on 165 of the 284 farms visited. As in the spring-wheat districts, good yields were obtained on the farms having low

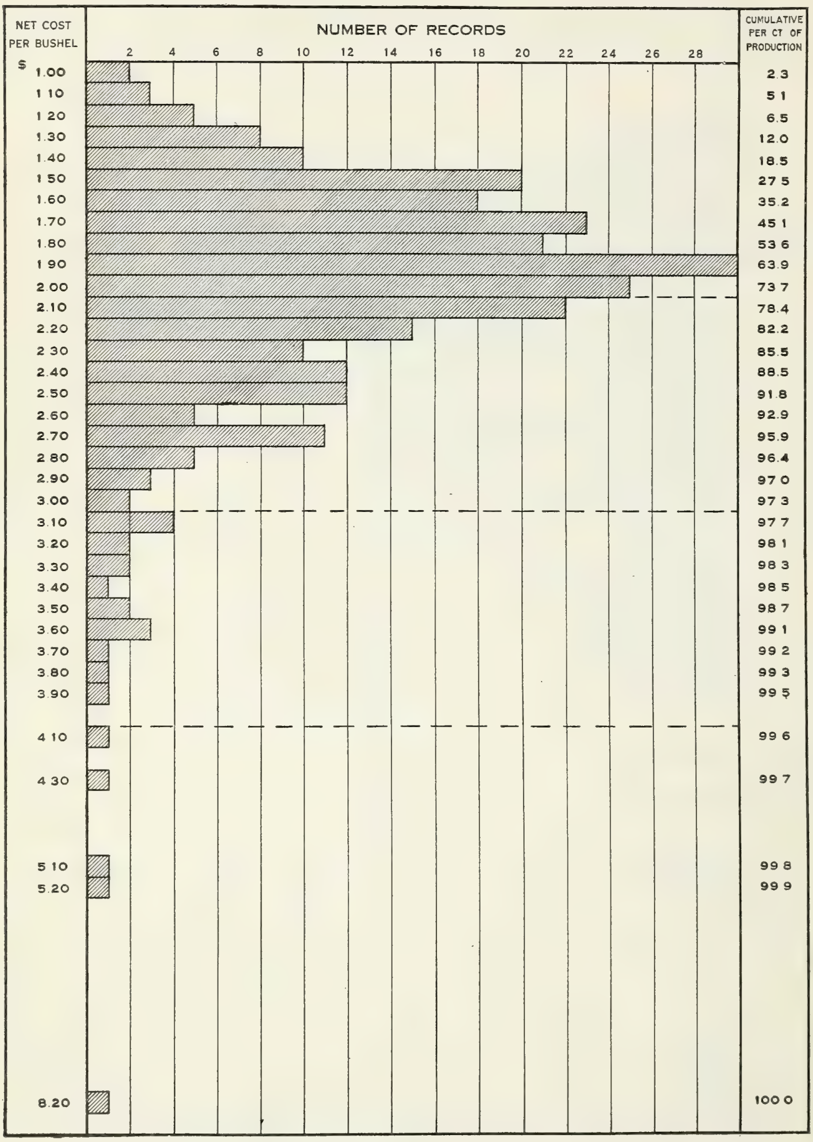

FIG. 7.—Variation in net cost per bushel, spring wheat, 1919.

bushel costs. A number of such farms reported yields as high as 15 to 25 bushels per acre. The farms on which the cost per bushel was exceptionally high reported yields ranging from less than 3 bushels to 8 and 10 bushels per acre. A number of the farmers with the higher costs abandoned a part of their wheat acreage because it was totally destroyed or in such condition that it was not worth the expense of harvesting.

ANALYSIS OF ITEMS OF COST.

The labor costs and other items of expense entering into the cost of wheat production have been expressed in terms of hours of labor and quantities of seed, twine, etc., wherever possible. This has been done because requirements expressed in these terms are more valuable for purposes of comparison than when expressed in the less stable terms of dollars and cents. These cost factors have been treated under the general headings, "Labor," "Material" "Thrashing," "Use cost of land," and "Other costs."

LABOR.

AVERAGE HOURS OF MAN AND HORSE LABOR PER ACRE.

Table XII shows the average number of hours per acre devoted to wheat production in the various regions studied.

The figures shown are averages for only those farms operated with horses, all farms on which the tractor or motor truck was used having been omitted in this tabulation.

The average hours per acre of man and horse labor for each district are representative, with the exception of any variation caused by different practices followed in providing labor for thrashing. In the spring-wheat areas the farmers furnished the thrashing crews in Morton, Clay, and Traverse Counties, and the total man and horse hours include all labor for hauling and pitching bundles in these counties. But in Grand Forks and Spink Counties the owner of the thrashing machine furnished the men and teams for thrashing, and this labor, which would amount to about 1¼ man and 2½ horse hours per acre, is not included in the averages shown in Table XII.

In the Kansas areas and Saline County, Mo., the crew was furnished by both farmers and thrashermen. Had the farmer furnished the entire crew the average hours of production would have been increased by about 1 man-hour per acre.

In all other winter-wheat areas, excepting Saline County, Mo., the thrashing crews, and therefore the thrashing labor, are included in the averages for these areas.

In the spring-wheat areas the average man-hours varied from nearly six hours per acre in Grand Forks County, N. Dak., to about nine hours per acre in Morton County, N. Dak. The hours per acre of horse labor in these two counties were 19.2 and 25.7, respectively. In the winter-wheat areas a greater variation was found, man labor varying from 7.3 hours per acre in Pawnee County, Kans., to 17.5 hours in Jasper County, Mo., and horse labor from 19.7 to 39.5 hours, respectively. When the total labor was divided as to land preparation and seeding, and harvesting and marketing, it was found that in nearly every case the bulk of total horse labor came in the fall and spring when the land was prepared and the crop seeded. In the spring-wheat areas there was usually little difference in man-hours as thus divided. Generally any difference that occurred indicated that more man labor was required in land preparation and seeding than in harvesting and marketing. In the winter-wheat areas wider variations occurred in the two divisions, and usually the man-hours for harvesting and marketing were higher than for land preparation and seeding.

TABLE XII.—*Average hours of man and horse labor, by counties, spring and winter wheat, 1919 (360 farms).*

[Farms using tractors or trucks not included.]

Region.	Preparation and seeding (hours per acre).		Harvesting and marketing (hours per acre).		Total.	
	Man.	Horse.	Man.	Horse.	Man.	Horse.
SPRING WHEAT.						
North Dakota:						
Grand Forks County	3.6	14.6	2.2	4.6	5.8	19.2
Morton County	5.4	19.6	3.8	6.1	9.2	25.7
South Dakota:						
Spink County	3.1	14.8	3.0	5.3	6.1	20.1
Minnesota:						
Clay County	4.2	15.1	4.0	7.3	8.2	22.4
Traverse County	4.1	17.3	4.7	8.4	8.8	25.7
WINTER WHEAT.						
Kansas:						
Ford County	2.8	12.0	4.8	8.8	7.6	20.8
Pawnee County	2.6	11.7	4.7	8.0	7.3	19.7
McPherson County	4.5	18.8	4.8	8.1	9.3	26.9
Missouri:						
Saline County	5.1	18.5	8.1	11.1	13.2	29.6
Jasper County	8.1	26.8	9.4	12.7	17.5	39.5
St. Charles County	8.2	25.1	8.9	11.5	17.1	36.6
Nebraska:						
Phelps County	3.7	13.0	5.5	8.6	9.2	21.6
Saline County	6.7	24.7	8.1	12.4	14.8	37.1
Keith County	2.7	9.3	6.9	10.1	9.6	19.4

VARIATION IN LABOR REQUIREMENTS.

From Tables XIII and XIV it is apparent that there was a wide variation among individual farms in the amount of labor devoted to growing an acre of wheat. In these tables the farm records included in Table XII were grouped according to total man hours per acre.

In the spring-wheat areas all but eight of the 159 farms were well represented in four groups, or in those classes having man labor requirements of from 4 to 12 hours per acre. In Grand Forks and Spink Counties, nearly all of the farms came within the two groups, "4 to 6" and "6 to 8" hours per acre. In Morton County the largest group of farms required from 8 to 10 hours of man labor per acre, and in both Minnesota areas the majority of all farms showed requirements of from 6 to 10 hours per acre. Of the total wheat acreage grown on the spring-wheat farms more than one-third was grown on farms having man labor requirements of from 6 to 8 hours; also a large acreage was represented by each group of farms commencing with 4 to 6 hours per acre, and including the 10 to 12 hour group.

TABLE XIII.—*Variation in labor requirements per acre, spring wheat, 1919 (159 farms).*

[Farms using tractors or trucks not included.]

Range of man hours per acre.	North Dakota.				South Dakota.		Minnesota.				Total.		Average hours per acre.	
	Grand Forks County.		Morton County.		Spink County.		Clay County.		Traverse County.				Man.	Horse.
	Farms.	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*		
Under 4	1	410	......	......	......	......	......	......	......	......	1	410	3.6	13.4
4 to 6	15	3,987	2	473	15	3,350	2	520	......	......	34	8,330	5.1	18.1
6 to 8	14	2,829	6	716	13	2,880	10	2,494	11	1,970	54	10,889	6.9	20.6
8 to 10	3	719	12	1,581	1	75	10	2,267	13	2,422	39	7,064	8.7	25.5
10 to 12	......	......	7	1,055	2	360	8	1,200	7	963	24	3,578	10.7	28.8
12 to 14	......	......	2	225	......	......	......	......	2	160	4	385	12.9	32.8
14 to 16	......	......	1	80	......	......	1	100	......	......	2	180	14.6	35.0
16 to 18	......	......	......	......	......	......	......	......	......	......	......	......	......	......
18 to 20	......	......	......	......	......	......	......	......	1	51	1	51	19.1	45.8
Total	33	7,945	30	4,130	31	6,665	31	6,581	34	5,566	159	30,887	7.4	22.1

TABLE XIV.—*Variation in labor requirement per acre, winter wheat, 1919 (201 farms).*

[Farms using tractors or trucks not included.]

Range of man-hours per acre.	Kansas.						Missouri.					
	Ford County.		Pawnee County.		McPherson County.		Saline County.		Jasper County.		St. Charles County.	
	Farms.	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*
Under 4	......	......	......	......	......	......	......	......	......	......	......	......
4 to 6	3	880	3	605	......	......	......	......	......	......	......	......
6 to 8	12	3,940	13	3,750	7	614	1	70	......	......	......	......
8 to 10	8	2,362	4	1,295	8	965	5	520	......	......	......	......
10 to 12	2	450	3	615	6	741	1	40	......	......	......	......
12 to 14	......	......	......	......	1	80	2	245	......	......	3	247
14 to 16	......	......	......	......	......	......	4	295	6	711	5	514
16 to 18	......	......	......	......	......	......	4	175	5	511	7	481
18 to 20	......	......	......	......	......	......	2	170	6	457	4	229
20 to 22	......	......	......	......	......	......	......	......	3	240	2	88
22 to 24	......	......	......	......	......	......	......	......	......	......	1	55
24 to 26	......	......	......	......	......	......	1	65	......	......	3	164
26 to 28	......	......	......	......	......	......	......	......	2	56	......	......
Total	25	7,632	23	6,265	22	2,400	20	1,580	22	1,975	25	1,778

TABLE XIV.—*Variation in labor requirements per acre, spring wheat, 1919 (201 farms)*—Continued.

Range of man-hours per acre.	Nebraska.						Total.		Average hours per acre.	
	Phelps County.		Saline County.		Keith County.				Man.	Horse.
	Farms.	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*	*Farms.*	*Acreage.*		
Under 4										
4 to 6	1	120					7	1,605	5.4	15.9
6 to 8	4	523			4	505	41	9,402	6.9	19.1
8 to 10	16	2,361					41	7,503	9.0	22.9
10 to 12	5	495	3	171	2	355	22	2,867	10.8	26.2
12 to 14	2	245	8	403	1	60	17	1,280	12.8	30.7
14 to 16			8	447	1	40	24	2,007	15.2	36.1
16 to 18			6	193			22	1,360	16.7	37.0
18 to 20			2	120			14	976	18.7	41.5
20 to 22			1	74			6	402	20.5	44.9
22 to 24							1	55	23.8	47.0
24 to 26							4	229	24.6	44.2
26 to 28							2	56	27.4	61.6
Total	28	3,744	28	1,408	8	960	201	27,742	10.0	24.8

In the winter-wheat areas each labor group from 6 to 20 hours per acre was well represented by farms in one or more of the counties visited. None of these farms reported less than 4 man-hours per acre, and the average for the 4 to 6 hour group was 5.4 hours. Likewise, few of the farms reported more than 20 hours per acre, although two farms with small acreages were in the 26 to 28 hour class. In the winter-wheat area the majority of farmers in the three Kansas counties and Phelps County, Nebr., reported comparatively low hours of labor per acre. The farmers in Saline County, Nebr., and Jasper and St. Charles Counties, Mo., reported comparatively high hours of labor, while those in Saline County, Mo., were fairly well distributed in all groups from 8 to 20 hours per acre. In Keith County, Nebr., but eight of the total farms were included in this tabulation because of the extensive use of tractors and employment of contract labor.

SUMMARY OF LABOR PRACTICES.

As an indication of variations in amount of labor expended per acre, a summary of labor practices is given in Tables XV to XIX inclusive.

TABLE XV.—*Summary of labor practices in the Dakotas, spring wheat, 1919.*

Practice.	Grand Forks County, N. Dak.				Morton County, N. Dak.				Spink County, S. Dak.			
	Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.	
	Per cent.	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*
Manure	72	8	9.4	21.8	67	8	10.9	20.1	72	7	11.2	27.5
Plow	100	91	1.7	9.0	85	68	2.4	12.0	98	60	2.0	10.8
Plow (tractor)	8	5	1.4	......	13	11	1.1	......	15	14	1.0	......
Disk[2]	67	26	1.0	4.2	77	31	1.3	5.5	78	25	.8	3.8
Disk (tractor)	......	......	......	......	5	11	.4	......	2	.3	.5	......
Harrow (spike)[3]	69	65	.4	2.0	90	82	.8	3.2	98	94	.3	1.7
Harrow after drill (spike)	21	16	.2	1.0	38	36	.5	2.0	42	37	.2	1.2
Roll	21	8	.4	1.9	10	10	.6	1.9	5	18	.4	1.9
Haul seed	38	37	.1	.2	33	34	.1	.2	18	25	.1	.2
Clean seed	77	74	.3	......	90	90	.3	......	68	68	.2	......
Treat seed	82	71	.1	......	95	94	.1	......	78	71	.1	......
Drill seed	100	100	.5	2.0	100	100	.6	2.4	100	97	.6	2.6
Drill (tractor)	......	......	......	......	......	......	......	......	5	3	1.2	......
Cut	100	100	.6	2.5	18	10	.7	2.7	82	68	.7	2.8
Cut (tractor)	......	......	......	......	......	......	......	......	8	10	1.1	......
Head and stack	......	......	......	......	90	90	2.5	4.3	25	20	2.7	4.6
Head and stack (tractor)	......	......	......	......	......	......	......	......	2	2	2.4	1.3
Shock	100	100	.7	......	18	9	.7	......	85	79	.9	......
Reshock	33	36	.1	......	8	3	.2	......	22	27	.1	......
Shock-thrash	100	100	([4])	......	5	3	1.3	2.6	85	81	1.0	1.9
Stack	......	......	......	......	13	8	1.6	1.9	......	......	......	......
Stack-thrash	......	......	......	......	97	[a] 97	.4	......	25	19	.3	......
Haul to granary	67	[b] 32	.5	.9	87	[a] 92	.2	.4	80	50	.6	1.1
Haul to market (from granary)	69	35	.7	2.1	90	93	.7	1.5	80	50	.8	1.6
Haul to market (from machine)	67	65	.5	1.4	13	7	.2	.5	56	50	.7	1.5

[1] Thrashing and hauling percentages are based upon bushels.

[2] Disking was done 1.3 times in Grand Forks County, 1.2 times in Morton County, and 1.1 times in Spink County.

[3] Harrowing was done 1.5 times in Grand Forks County, 1.8 times in Morton County, and 1.4 times in Spink County.

[4] Contract.

[a] Some grain was thrashed into bins.

TABLE XVI.—*Summary of labor practices in Minnesota, spring wheat, 1919.*

Practice.	Clay County.				Traverse County.			
	Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.	
	Per cent.	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*
Manure	77	9	10.2	31.4	76	11	11.0	29.8
Plow	85	48	2.2	11.2	93	82	2.2	11.3
Plow (tractor)	26	41	1.1	......	12	11	1.7	......
Disk[2]	69	26	1.1	4.5	43	14	1.5	6.0
Disk (tractor)	10	5	.6	......	5	3	.6	......
Harrow (spike)[3]	85	59	.4	1.8	95	93	.5	2.1
Harrow (spike) tractor	10	13	.2	......	5	7	.2	......
Harrow spring	5	3	.8	3.2	......	......	......	......
Harrow spring tractor	10	28	.5	......	......	......	......	......
Harrow after drill (spike)	51	38	.2	1.0	52	57	.3	1.2
Harrow after drill tractor	5	3	.4	......	......	......	......	......
Roll	8	4	.8	3.1	2	1	.5	2.0
Haul seed	44	50	.1	.2	17	16	.1	.2
Clean seed	79	82	.2	......	64	61	.3	......
Treat seed	44	36	.1	......	79	75	.1	......
Drill seed	100	100	.6	2.4	100	100	.6	2.4
Cut	97	88	.7	2.9	95	92	.7	2.9
Cut (tractor)	5	12	1.7	......	7	8	1.1	......
Shock	100	100	.9	......	100	100	.9	......
Reshock	46	38	.2	......	52	47	.2	......
Shock-thrash	100	100	1.4	2.5	86	91	1.3	2.6
Stack	......	......	......	......	14	10	2.8	3.8
Stack-thrash	......	......	......	......	14	9	.9	......
Haul to granary	74	63	.3	.6	90	86	.4	.7
Haul to market (from granary)	74	63	.8	1.7	90	86	1.0	2.0
Haul to market (from machine)	56	37	.4	.8	24	14	.7	1.3

[1] Thrashing and hauling percentage are based upon bushels.

[2] Disking was done 1.2 times in Clay County and 1.3 times in Traverse County.

[3] Harrowing was done 1.6 times in Clay County and 1.7 times in Traverse County.

TABLE XVII.—*Summary of labor practices in Kansas, winter wheat, 1919.*

Practice.	Ford County.				Pawnee County.				McPherson County.			
	Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.	
	Per cent.	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse*
Manure	25	1	10.6	24.3	34	4	8.4	17.8	66	14	7.5	18.3
Plow	47	17	2.0	9.5	28	13	2.4	9.6	91	63	2.4	11.1
Plow (tractor)	9	6	1.2	......	12	8	1.2	......	20	16	1.3	......
Plow land with cultivator	6	4	2.6	6.4	......	......	......	......	......	......	......	......
List	59	31	1.1	5.0	75	49	1.0	4.7	40	19	1.4	5.9
List (tractor)	......	......	......	......	16	8	.5	......	......	......	......	......
Sled	59	32	1.0	3.4	78	54	.8	3.5	40	19	.9	3.8
Disk[2]	53	25	1.6	8.4	22	11	1.6	7.7	37	12	1.2	5.3
Disk (tractor)	3	3	.3	......	3	1	1.7	......	......	......	......	......
Harrow (spike)[3]	78	41	.4	2.0	59	44	.5	2.3	100	99	.8	3.7
Harrow (spike) tractor	......	......	......	......	6	2	.2	......	......	......	......	......
Harrow after planting	......	......	......	......	......	......	......	......	6	13	.4	1.6
Apply grasshopper poison	56	50	.1	.2	9	7	.1	.2	3	1	.1	......
Haul seed	88	80	.1	.2	34	25	.1	.2	34	34	.1	.2
Clean seed	22	20	.1	......	9	7	.1	......	43	44	.1	......
Treat seed	6	2	.1	......	......	......	......	......	9	9	.1	......
Drill	100	100	.6	2.9	100	92	.7	2.9	100	100	.7	2.9
Drill (tractor)	......	......	......	......	3	8	.9	......	......	......	......	......
Cut	62	31	.7	3.1	41	14	.8	3.6	86	78	.8	3.4
Cut (tractor)	9	5	1.2	......	16	8	.8	......	17	20	1.2	......
Head and stack	84	64	3.0	4.6	97	78	3.5	5.4	3	2	3.5	4.9
Shock	69	35	1.5	......	56	22	1.7	......	100	98	1.1	......
Reshock	6	4	.2	......	3	1	.3	......	9	6	.1	......
Shock thrash	53	39	1.6	3.2	50	25	1.7	3.5	69	76	1.5	2.9
Stack	16	5	2.7	3.2	6	1	3.0	3.0	37	3	2.0	2.2
Stack thrash	88	61	.6	......	97	75	(4)	(4)	40	24	(4)	(4)
Haul to granary	91	76	.7	1.3	91	[a] 70	.6	1.0	91	76	.5	.8
Haul to market (from granary)	91	76	1.1	2.8	91	71	.7	1.6	91	76	.9	1.7
Haul to market (from machine)	25	24	1.6	3.7	53	29	.6	1.3	31	24	1.0	1.9

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[1] Thrashing and hauling percentages are based upon bushels.

[2] Disking was done 1.5 times in Ford County, 1.8 times in Pawnee County, and 1.2 times in McPherson County.

[3] Harrowing was done 1.1 times in Ford County, 1.2 times in Pawnee County, and 2.1 times in McPherson County.

[4] Contract.

[a] Some grain thrashed into the bins.

Table XVIII.—*Summary of labor practices in Missouri, winter wheat, 1919.*

Practice.	Saline County.				Jasper County.				St. Charles County.			
	Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.	
	Per cent.	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*
Haul and fill gullies	......	......	......	......	......	......	......	......	32	......	1.4	2.3
Cut stalks	3	5	0.7	1.4	......	......	......	......	......	......	......	......
Manure	24	2	8.9	12.0	60	4	14.1	23.0	68	7	11.0	19.2
Disk before plow	14	8	1.8	7.0	3	2	1.2	4.8	......	......	......	......
Plow	79	55	3.2	11.8	93	84	3.6	12.5	82	54	4.8	15.7
Plow (tractor)	10	13	1.2	......	17	12	2.3	......	32	23	1.7	......
Plow land with cultivator	3	3	.7	2.1	......	......	......	......	84	21	1.7	3.5
Disk[2]	69	43	1.3	5.3	77	51	1.4	5.4	32	16	1.9	6.8
Disk (tractor)	7	4	1.2	......	3	5	.7	......	8	6	.8	......
Floating	10	8	.9	1.6	13	10	.8	3.2	5	5	.8	3.7
Drag	7	7	1.3	7.2	......	......	......	......	......	......	......	......
Harrow-spike (horse)[3]	93	86	1.1	4.2	97	99	1.4	5.6	97	81	1.6	5.8
Harrow-spike (tractor)	......	......	......	......	3	3	.3	......	5	5	.3	......
Harrow after drill	......	......	......	......	3	3	.4	1.6	......	......	......	......
Roll	14	9	.8	2.0	13	16	.8	2.6	37	27	.9	2.8
Ditch	......	......	......	......	......	......	......	......	13	......	.3	.6
Haul fertilizer)	3	(4)	1.0	2.0	97	99	.3	.5	......	......	......	......
Haul seed	41	39	.1	.2	37	34	.2	.4	24	19	.1	.2
Clean seed	55	55	.2	......	100	100	.2	......	66	62	.2	......
Treat seed	72	76	.2	......	3	6	.2	......	32	24	.2	......
Drill seed	100	100	.9	2.9	100	100	.9	2.8	100	100	1.0	2.9
Cut	97	91	1.3	5.2	100	100	.9	3.8	92	87	1.0	3.8
Cut (tractor)	7	9	1.7	......	......	......	......	......	11	13	1.2	......
Shock	100	100	2.3	......	100	100	2.0	......	100	100	2.1	......
Reshock	76	77	.4	......	83	87	.2	......	87	87	.4	......
Stack	10	7	4.4	4.0	23	20	3.4	3.9	......	......	......	......
Shock-thrash	90	94	4.9	6.0	80	81	3.3	4.0	100	100	3.4	4.1
Stack-thrash	10	6	2.6	......	23	19	1.7	......	......	......	......	......
Haul to granary	14	14	.4	.4	100	79	.9	1.2	66	31	.9	.6
Haul to market (from granary)	14	14	1.1	2.2	100	79	2.2	4.3	71	38	1.9	3.6
Haul to market (from machine)	86	86	1.1	2.3	37	21	1.6	3.1	76	62	2.0	2.9

[1] Thrashing and hauling percentages are based upon bushels.

[2] Disking was done 1.3 times in Saline County, 1.2 times in Jasper County, and 1.4 times in St. Charles County.

[3] Harrowing was done 1.6 times in Saline County, 2.4 times in Jasper County, and 1.8 times in St. Charles County.

[4] Less than one-half of 1 per cent.

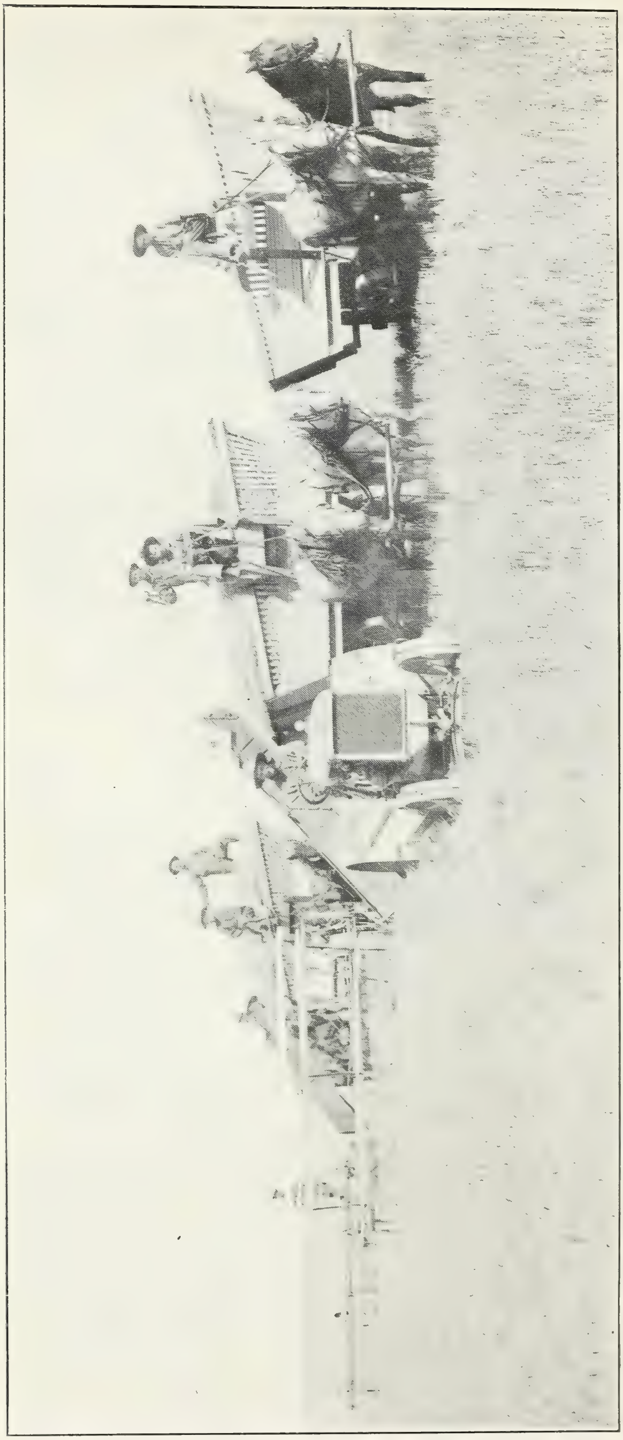
TABLE XIX.—*Summary of labor practices in Nebraska, winter wheat, 1919.*

Practice.	Phelps County.				Saline County.				Keith County.			
	Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.		Records.	Acreage.[1]	Average hours per acre.	
	Per cent.	*Per cent.*	*Man.*	*Horse*	*Per cent.*	*Per cent.*	*Man.*	*Horse*	*Per cent.*	*Per cent.*	*Man.*	*Horse.*
Harrow stalks	53	18	0.4	1.8	......	......	......	......	......	......	......	......
Cut stalks	20	5	.6	1.7	......	......	......	......	......	......	......	......
Manure	70	7	9.1	21.3	80	17	8.5	23.8	22	1	12.7	25.4
Plow	100	61	2.3	9.5	89	74	2.9	11.2	26	6	3.6	13.7
Plow (tractor)	7	7	.9	......	17	24	1.3	......	48	57	.9	......
Plow land with cultivator	3	1	1.9	7.6	......	......	......	......	4	1	1.4	1.4
Break corn stalks	......	......	......	......	......	......	......	......	39	12	.4	1.6
Break corn stalks (tractor)	......	......	......	......	......	......	......	......	4	1	.4	......
Disk[2]	33	16	.8	3.6	69	56	1.4	5.8	48	23	2.3	9.7
Disk (tractor)	......	......	......	......	......	......	......	......	30	40	.8	......
Harrow (spike)[3]	100	65	.6	2.5	100	99	.7	2.8	26	14	.5	1.9
Harrow (spike) (tractor)	......	......	......	......	......	......	......	......	4	1	.4	......
Harrow after drill	......	......	......	......	3	1	.4	1.6	......	......	......	......
Roll	3	.2	.4	1.6	6	3	.8	3.4	......	......	......	......
Apply grass-hopper poison	30	24	.1	.1	......	......	......	......	......	......	......	......
Haul seed	17	21	.1	.2	9	6	.2	.4	13	22	.1	.2
Clean seed	30	23	.1	......	54	54	.2	......	52	60	.1	......
Treat seed	10	8	.1	......	3	3	.1	......	35	31	.1	......
Drill seed	97	97	1.1	3.0	100	100	.9	3.6	70	46	1.2	3.3
Drill seed (tractor)	3	3	.6	......	......	......	......	......	30	54	.7	......
Cut	93	90	.7	3.5	100	93	.9	3.9	39	32	.8	3.3
Cut (tractor)	7	9	1.2	......	3	7	1.2	......	30	45	.9	......
Head and stack	3	1	3.5	5.0	......	......	......	......	35	15	2.3	3.9
Head and stack (tractor)	......	......	......	......	......	......	......	......	4	8	2.2	1.6
Shock	99	99	1.0	......	100	96	1.6	......	65	71	1.3	......
Re-shock	37	38	.2	......	46	42	.2	......	26	36	.3	......
Stack	37	28	2.6	2.9	6	2	4.2	4.8	22	9	2.8	2.7
Shock thrash	63	73	1.9	2.5	94	98	3.5	5.0	52	70	2.6	3.3
Stack thrash	40	27	.9	......	6	2	1.4	......	52	30	1.3	......
Haul to granary	83	59	.3	.5	89	66	.8	1.2	78	69	.8	1.3
Haul to market (from granary)	83	59	1.0	2.0	89	66	1.5	3.0	78	69	2.2	4.6
Haul to market (from machine)	60	41	.8	1.6	46	34	1.4	2.5	35	31	.6	.8

[1] Thrashing and hauling percentage are based upon bushels.
[2] Disking was done 1.0 time in Phelps County, 1.4 times in Saline County, and 2.1 times in Keith County.
[3] Harrowing was done 1.9 times in Phelps County, 1.9 times in Saline County, and 1.3 times in Keith County.

Plowing is an operation that requires a large amount of power and labor as compared with other farm operations. In the spring-wheat area 86 per cent of the total wheat acreage was plowed, and of this 20 per cent was plowed with tractor power. The remaining 14 per cent of the wheat acreage was corn stubble and potato land which was not plowed but usually disk-harrowed instead. Clay County, Minn., was foremost in the use of the tractor for plowing, 41 per cent of the acreage being tractor-plowed in this area. In the various winter-wheat areas visited a wide variation existed in the percentage of total wheat acreage plowed. In Pawnee and Ford Counties, Kans., but 21 and 23 per cent, respectively, of the wheat land was plowed, while in the other districts from 60 to 98 per cent was plowed. The tractor was extensively used in St. Charles County, Mo., where 24 per cent of the land was plowed by tractor power. In Ford, Pawnee, and McPherson Counties the lister was substituted

THE GRAIN BINDER IS MOST COMMONLY USED FOR HARVESTING WHEAT IN THE SPRING-WHEAT AREA.



Photograph by courtesy of Bergman Brothers, Kimball, Nebr.

A HEADER OUTFIT THAT COVERS A LARGE ACREAGE PER DAY IN HARVESTING WHEAT.

for the plow on a part of the wheat acreage. (See fig. 8.) In Ford County 31 per cent of the wheat area was listed; in Pawnee County 50 per cent; and in McPherson County 19 per cent of the land was broken in this manner. After listing a "ridge buster," or "sled," as it is commonly called, was used for the purpose of tearing down the ridges or rows left by the lister. In some of the areas a part of the corn stubble land was prepared for seeding by running over it with a two-horse disk cultivator. In St. Charles County, Mo., 21 per cent of the wheat acreage was gone over with the disk cultivator. The disk harrow was extensively used in some areas for all preparation prior to drilling. On some farms a part of the grain stubble and corn land received no preparation, but was seeded with a disk drill, which served the purposes of preparing the land and seeding in one operation. (See fig. 9.)

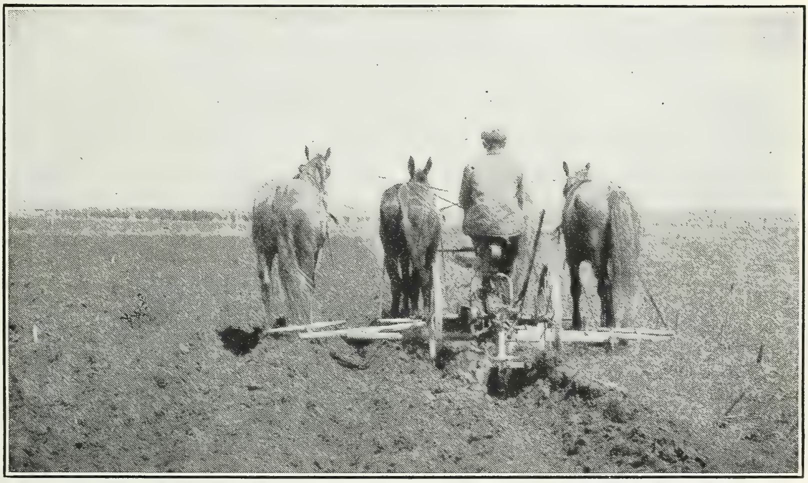


FIG. 8.—Preparation of land for wheat with the one-row lister.

The spike-tooth harrow was used extensively in both spring and winter wheat areas. In the spring-wheat areas 76 per cent of the entire acreage was spike-harrowed before seeding, and 30 per cent of this acreage was harrowed again after seeding. The spike-tooth harrow was also commonly used in the winter-wheat areas, but none of this work was reported after seeding.

In the spring-wheat districts 83 per cent of the acreage was cut with a binder and 17 per cent was headed. (See Pl. I.) Of the total acreage harvested, 6 per cent was cut with tractor power. All work with the header was reported from Morton County, N. Dak., and Spink County, S. Dak. In these two areas 88 and 20 per cent, respectively, of the total acreage was headed. In the winter-wheat districts 66 per cent of the total wheat acreage was harvested with the binder and 34 per cent was headed. Tractor power was used in harvesting grain in all areas excepting Jasper County, Mo. Of the winter-wheat acreage 13 per cent was cut with tractor power. Heading was found to be most common in Ford and Pawnee Counties, Kans. About 64 per cent of the Ford County acreage and 78 per cent of the Pawnee County acreage was harvested with the header (see Pl. II).

In both spring and winter wheat regions most of the bundle grain was shock thrashed. The headed grain was stacked before thrashing. The grain was either hauled direct from the thrashing machine to local elevators and railroad cars or stored on the farm. In some localities grain elevators were soon filled, railroad cars were not available at thrashing time, and adequate storage facilities were not available on the farm, so that a part of the wheat was often dumped in piles on the ground until marketing and storage facilities became available.

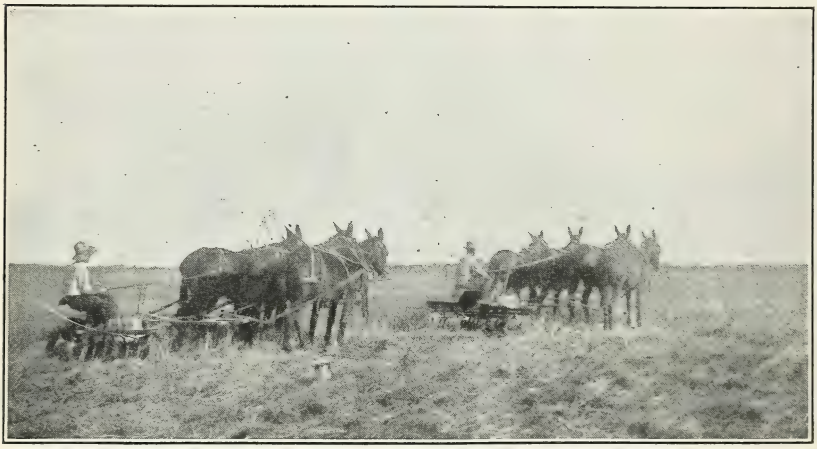


FIG. 9.—Disking stubble land preparatory to drilling wheat without further preparation.

In every case all labor and expenses incident to storing and hauling grain to market have been included in the cost of production.

LABOR RATES.

Man-labor rate.—The man-labor rates, as shown in Table XX, are based on prevailing month and day wages paid for farm labor at the time the work was done, including board, when furnished. The labor of the farmer and any members of his family was charged at the same rate. The labor prior to harvesting was mainly performed by the farmer, with the aid of month hands. During the harvest period, however, because of the scarcity of harvest hands and the transient character of labor employed, practically all labor was hired on a day basis at a much higher wage. For this reason different rates have been used for seed-bed preparation and seeding and for harvesting and marketing. The wage paid was mainly governed by the competition for farm labor at the time the work was done; it will be noted that there is considerable variation in the rates used in the several districts visited.

Horse-labor rate.—The horse-labor rates, as shown in Table XX, are based partially on the prevailing charge for team work in the regions visited, and partially on the cost of horse labor as obtained from detailed cost records which were available for some of the States in which this investigation was made. It will be noted that the horse-labor rate in Ford County, Kans., was higher than in other districts visited; this was due to partial crop failures in 1918 and 1919, which resulted in a relatively high cost of grain and roughage.

TABLE XX.—*Man and horse labor rates per hour, spring and winter wheat, 1919 (481 farms).*

State and county.	Seed-bed preparation and seeding.		Harvesting and marketing.	
	Man rate.	Horse rate.	Man rate.	Horse rate.
SPRING-WHEAT AREAS.				
North Dakota:				
Grand Forks County	$0.35	$0.20	$0.60	$0.20
Morton County	.35	.20	.60	.20
South Dakota:				
Spink County	.40	.20	.65	.20
Minnesota:				
Clay County	.35	.20	.60	.20
Traverse County	.35	.20	.60	.20
WINTER-WHEAT AREAS.				
Kansas:				
Ford County	.35	.25	.75	.25
Pawnee County	.30	.18	.60	.18
McPherson County	.35	.20	.75	.20
Missouri:				
Saline County	.30	.18	.60	.18
Jasper County	.30	.18	.50	.18
St. Charles County	.25	.18	.55	.18
Nebraska:				
Phelps County	.35	.20	.65	.20
Saline County	.35	.20	.70	.20
Keith County	.35	.20	.80	.20

AVERAGE LABOR COST PER ACRE.

The labor cost, as shown in Table XXI, includes all man-and-horse labor expended by the farmer and any contract labor hired. All work in which the farmer's men and horses had no part has been recorded as contract labor. This includes a small amount of plowing for which the farmer paid a stipulated sum per acre for man and horses or tractor and plows; a small amount of cleaning seed wheat; a nominal amount of cutting wheat with the grain binder; and some marketing grain, which was usually hauled with a truck at a fixed charge per bushel per mile hauled. The relatively high charge for contract labor in Keith County, Nebr., was largely due to the great amount of grain hauled to market by contract labor, this being 66 per cent of all that was produced.

In some districts considerable work was done with tractors. Unless contract work, the man hours for operating the tractor were included under labor costs; but obviously no cost for horse labor would occur. The maintenance and upkeep cost of the tractor have been charged under machinery costs and not as hours of tractor labor.

The great variations in average labor costs, by counties, as shown in Table XXI, are due to the variation in man and horse labor rates used in calculating labor costs, and to the variations in amounts of labor devoted to raising an acre of wheat. As previously shown, considerable variation existed in the average labor rates determined for various counties. However, it does not necessarily follow that those counties having the higher labor rates had the higher total labor costs per acre.

TABLE XXI.—*Average cost per acre of labor, by counties, spring and winter wheat, 1919 (481 farms).*

Region.	Direct man-and-horse labor cost.	Contract labor cost.	Total cost.
North Dakota:			
Grand Forks County	$6.18	$0.11	$6.29
Morton County	8.41	.06	8.47
South Dakota:			
Spink County	6.72	.07	6.79
Minnesota:			
Clay County	7.26	.03	7.29
Traverse County	8.87	.03	8.90
All spring wheat	7.30	.07	7.37
Kansas:			
Ford County	9.62	.04	9.66
Pawnee County	6.78	.02	6.80
McPherson County	10.70	.02	10.72
Missouri:			
Saline County	11.19	.23	11.42
Jasper County	13.41	.22	13.63
St. Charles County	12.37	....	12.37
Nebraska:			
Phelps County	8.99	....	8.99
Saline County	14.72	.01	14.73
Keith County	7.69	1.50	9.19
All winter wheat	9.66	.19	9.85

MATERIALS.

SEED.

The most common variety of seed wheat for the spring-wheat districts was the Marquis, and for the winter-wheat districts the Turkey Red. An average of approximately 3.5 per cent of the winter-wheat acreage was reseeded, while no reseeding was required for spring wheat.

The rate of application is the average for one seeding only, but the cost per acre includes the value of the seed used on the reseeded acreage. For this reason, and also because the acre cost for seed is a weighted average, the average amount applied per acre multiplied by the average price per bushel will not equal the cost per acre.

The value of seed wheat per bushel is an average. Some men bought high-grade recleaned seed and some used their own supply for planting. The figures given include the value of any materials used for seed treatment. All farm-grown seed was charged at its farm sale value at planting time.

The average rate of seeding and the average price per bushel were somewhat less for the winter wheat than for the spring wheat, with a correspondingly lower cost per acre for winter wheat. (See Table XXI.)

BINDER TWINE.

Because of the light straw, the average binder-twine requirements per acre were appreciably less in the spring-wheat than in the winter-wheat districts.

In three spring-wheat and in four winter-wheat districts the entire acreage was cut with a binder. Principally because of the short straw in Morton County, N. Dak., 90 per cent of the acreage was cut with a header. The average price paid for twine varied from 22 cents per pound in Clay County, Minn., to 29 cents in Grand Forks County, N. Dak., and the average for all winter wheat was 1 cent per pound higher than for all spring wheat. (See Table XXIII.)

TABLE XXII.—*Seed requirements per acre, spring and winter wheat, 1919 (481 farms).*

State and county.	Per cent of acreage re-seeded.	Rate of application.	Price per bushel.	Average cost per acre.
North Dakota:		*Bushels.*		
Grand Forks County		1.39	$2.44	$3.39
Morton County		1.23	2.41	2.98
South Dakota:				
Spink County		1.20	2.32	2.78
Minnesota:				
Clay County		1.36	2.44	3.45
Traverse County		1.41	2.41	3.38
All spring wheat		1.31	2.40	3.21
Kansas:				
Ford County	4.4	.77	2.23	1.79
Pawnee County	9.8	.95	2.12	2.19
McPherson County	1.4	1.06	1.98	2.36
Missouri:				
Saline County		1.30	2.10	2.73
Jasper County	.2	1.23	2.05	2.52
St. Charles County		1.14	2.21	2.58
Nebraska:				
Phelps County	1.4	1.04	2.06	2.13
Saline County		1.44	2.09	2.99
Keith County		.92	2.05	1.72
All winter wheat	3.4	1.11	2.12	2.18

TABLE XXIII.—*Binder twine requirements, spring and winter wheat, 1919 (481 farms).*

State and county.	Per cent of acreage cut with binder.	Amount used per acre.	Cost per pound.	Cost per acre.
North Dakota:		*Pounds.*		
Grand Forks County	100	1.91	$0.29	$0.57
Morton County	10	1.32	.25	.33
South Dakota:				
Spink County	78	1.98	.25	.50
Minnesota:				
Clay County	100	2.21	.22	.50
Traverse County	100	2.00	.23	.46
All spring wheat	83	2.03	.25	.51
Kansas:				
Ford County	36	3.49	.25	.87
Pawnee County	22	3.23	.28	.91
McPherson County	98	2.80	.23	.64
Missouri:				
Saline County	100	2.85	.23	.66
Jasper County	100	2.32	.23	.53
St. Charles County	100	2.26	.25	.55
Nebraska:				
Phelps County	99	2.68	.24	.63
Saline County	100	3.69	.24	.87
Keith County	77	2.31	.25	.58
All winter wheat	66	2.80	.24	.68

MANURE AND STRAW.

When manure is applied to a particular crop, other crops following in the rotation get part of the benefit. This cost then should be distributed among the different crops grown. When applied directly to wheat, 50 per cent of the estimated value was charged; when applied to the crop immediately preceding, 30 per cent was charged; and when two other crops preceded, 20 per cent was charged to the wheat.

The largest number of farmers reporting the use of manure (80 per cent) was for Saline County, Nebr., while the smallest number was for Keith County, Nebr. In Ford County, Kans., and Keith County, Nebr., only 1 per cent of the total wheat acreage was manured. Farmers in these counties regard manure and straw of more value for top dressing to conserve moisture and prevent "blowing" of the land than as a fertilizer. In these two counties not enough moisture is available to make manure valuable as a fertilizer.

For the spring-wheat districts 8 per cent of the total wheat acreage received an application of manure and straw, while for the winter wheat only 5 per cent of the total acreage was covered. (See Table XXIV.)

GREEN MANURE.

In St. Charles County, Mo., it is a common practice to plow under a certain number of acres of new clover seeding each year. Corn is usually grown on this land for one or two years, followed by wheat for one or two years more. It will be readily seen that this practice results in material benefit to the crops which follow. From each farmer an estimate was obtained relative to the amount of clover seed used and the time required to sow this seed on the average amount of new seeding plowed under each year; also the crops following on this land were noted. With these data available a charge for the value of the clover seed used and the time required to sow it was computed, which amounted to $2.80 per acre. This cost was prorated to the crops receiving benefit. In the case of wheat this charge amounted to $0.33 per acre.

TABLE XXIV.—*Straw and manure applied per acre, spring and winter wheat, 1919 (481 farms).*

State and county.	Per cent of farmers reporting.	Per cent of total acreage covered.	Rate of application per acre.	Cost per acre actually covered.
North Dakota:			*Tons.*	
Grand Forks County	72	8	10.28	$5.09
Morton County	67	8	6.84	5.66
South Dakota:				
Spink County	72	7	9.91	6.65
Minnesota:				
Clay County	77	9	13.67	10.84
Traverse County	76	11	11.41	6.44
All spring wheat	73	8	10.53	6.96
Kansas:				
Ford County	25	1	8.90	10.77
Pawnee County	34	4	9.52	5.41
McPherson County	60	14	6.40	5.38
Missouri:				
Saline County	24	2	6.50	5.44
Jasper County	60	4	9.43	7.96
St. Charles County	68	7	9.24	6.94
Nebraska:				
Phelps County	70	7	8.23	2.57
Saline County	80	17	7.84	2.45
Keith County	22	1	4.95	3.96
All winter wheat	51	5	7.98	4.87

COMMERCIAL FERTILIZER.

Commercial fertilizer was not used in any of the areas visited except Missouri, and in this State to no appreciable extent except in Jasper County. In this county 97 per cent of the men interviewed used commercial fertilizer on their entire wheat acreage, and 3 per cent used no fertilizer on this crop. The quantity applied averaged 100 pounds per acre and the average cost was $42 per ton.

In St. Charles and Saline Counties commercial fertilizer on wheat was not reported except on one farm in each county, where a very small acreage was fertilized, more as an experiment than as a regular practice.

GRASSHOPPER CONTROL.

In Ford County, Kans., much wheat was destroyed by grasshoppers. To control these pests a mixture in the proportion of about 20 pounds of bran, 1 pound of arsenic or Paris green, ½ gallon of molasses, and 2 oranges or lemons was used. Some of the poison was furnished gratis by the county, so only such poison as was purchased by the farmer is given on the records. Twelve men in Ford County, Kans., and 13 in Phelps County, Nebr., reported the use of grasshopper poison; on these farms this charge was of little importance, and, prorated over the entire acreage surveyed, amounted to but 2 cents per acre in Ford County and 1 cent in Phelps County.

TABLE XXV.—*Thrashing practices and costs, spring and winter wheat, 1919 (481 farms).*

State and county.	Prevailing thrashing practices.					Average cost per acre for the region.
	Thrashing done from—	Part of crew[1] furnished by—		Per cent of production.	Average rate per bushel.	
		Thrasherman.	Farmer.			
SPRING WHEAT.						
North Dakota:						
Grand Forks County	Shock	All		100	$0.27	$2.78
Morton County	Stack		All	100	.10	.43
South Dakota:						
Spink County	Shock	All		92	.27	2.68
Minnesota:						
Clay County	Shock		All	97	.13	1.18
Traverse County	Shock		All	99	.13	1.13
WINTER WHEAT.						
Kansas:						
Ford County	Stack	All		57	.20	2.58
	Shock	Field pitchers	Bundle haulers	43	.19	
Pawnee County	Stack	All		75	.20	2.67
	Shock	Field pitchers	Bundle haulers	25	.19	
McPherson County	Stack	All		25	.24	2.83
	Shock	Field pitchers	Bundle haulers	75	.22	
Missouri:						
Saline County	Shock		All	63	.16	3.37
	Shock	All		37	.29	
Jasper County	Shock		All	100	.08	1.45
St. Charles County	Shock		All	100	.10	1.86
Nebraska:						
Phelps County	Shock		All	99	.11	1.18
	Stack		All			
Saline County	Shock		All	100	.11	1.98
Keith County	Shock		All	92	.10	1.91
	Stack		All			

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[1] In every case the thrasherman furnished the crew for operating the separator and engine and the farmer furnished the men and horses for taking care of the thrashed grain.

THRASHING PRACTICES AND COSTS.

The main thing which determined the rate per bushel paid for thrashing was the proportion in which the thrashing crew was furnished by the farmer and the thrasherman. (See Table XXV.) In some regions the wheat yields varied so greatly that thrashing was paid for on an hour basis rather than a bushel basis, and of course farms with low yields had a comparatively high thrashing rate per bushel.

In three of the spring-wheat districts the farmers usually furnished all of the thrashing crew, and the average thrashing rate varied from 10 cents per bushel in Morton County, N. Dak., to 13 cents in both of the other two counties. In Grand Forks County, N. Dak., and

Spink County, S. Dak., the thrasherman usually furnished the thrashing crew, and the average rate for thrashing was 27 cents per bushel in both counties.

In the Kansas areas the farmers furnished the bundle haulers and teams and the thrasherman furnished field pitchers, where shock thrashing was done; where the grain was thrashed from the stack, the grain pitchers were furnished by the thrasherman. In any case, the crew furnished by the thrasherman did not vary to any marked extent, and the rate per bushel was fairly uniform, being slightly higher for stack thrashing.

In Saline County, Mo., 63 per cent of the production was thrashed with the farmer's crew and 37 per cent with the thrasherman's crew. The rates were 16 cents and 29 cents a bushel. In the other winter-wheat areas the thrashing crews were furnished by the farmers in nearly every case and the rates averaged from 8 cents to 11 cents a bushel.

The average cost per acre varied in each region according to yield and rate per bushel. The average acre cost for all winter wheat was 52 cents greater than the average for all spring wheat, but the average bushel cost was 4 cents less for winter wheat.

USE-COST OF LAND OR LAND RENT.

An estimate of the value of the land on which wheat was grown was obtained from each farmer visited. The current interest rate on first mortgages was also determined for each district. The result obtained by multiplying the investment in wheat land by the interest rate was used as the charge for use of land on owned farms. If the land was rented on a cash basis the actual cash rent paid per acre was used. If the land was share-rented the value of any items furnished by the landlord, such as seed, twine, thrashing, crop insurance, etc., was charged as a cost to the operator; these items were then deducted from the value at thrashing time of the share of wheat given to the landlord, the difference appearing as the operator's cost for the use of land. The one-half share rent system predominated in the Spring-Wheat Belt, and the one-third share rent system was most common in the Winter-Wheat Belt. Approximately 30 per cent of the spring-wheat acreage was rented on a one-half share basis and 62 per cent of the wheat land was owned by the operator. About 47 per cent of the winter-wheat acreage was one-third share-rented and 42 per cent of the wheat land was owned by the operator.

On owned farms the market value of the wheat land influenced the land-rent charge. On share-rented land the yield per acre, the share given as rent, and the part of the expenses paid by the landlord are the dominating factors.

In the spring-wheat areas the interest on investment exceeded the value of share-rent paid, while in the winter-wheat districts the reverse was true.

TABLE XXVI.—*Use-cost of land per acre, spring and winter wheat, 1919 (481 farms).*

State and county.	Owned land.		Rented land.				
	Value per acre.	Interest on investment.	One-half share.	One-third share.	Two-fifths share.	One-fourth share.	Cash.
North Dakota:							
Grand Forks County	$80	$4.79	$3.43	$4.56	....	....	$4.92
Morton County	36	2.16	2.65	2.87	....	$1.57	1.25
South Dakota:							
Spink County	134	8.06	7.50	3.30	....	3.35	....
Minnesota:							
Clay County	137	8.20	3.80	3.31	....	....	3.53
Traverse County	108	6.50	4.24	5.55	....	....	3.00
All spring wheat	100	6.00	4.90	3.58	....	2.02	3.52
Kansas:							
Ford County	55	3.28	9.96	9.12	....	3.87	....
Pawnee County	87	5.23	9.49	9.09	$11.26	....	6.00
McPherson County	134	8.06	....	8.34	12.27	....	7.05
Missouri:							
Saline County	241	14.44	13.60	13.49	18.08	....	7.82
Jasper County	135	8.09	....	11.98	....	....	....
St. Charles County	173	10.38	....	13.77	20.26	....	9.90
Nebraska:							
Phelps County	123	7.37	....	6.70	....	....	....
Saline County	213	12.80	....	12.27	15.06	....	....
Keith County	92	5.53	....	11.67	....	....	....
All winter wheat	122	7.33	10.90	9.50	14.13	3.87	8.33

Because of the lower land values and lower yield of wheat in the Spring-Wheat Belt, the charge for the use of land is considerably lower there than in the Winter-Wheat Belt. (See Table XXVI.)

OTHER COSTS.

TAXES AND INSURANCE.

An estimate was obtained from each man interviewed concerning his real estate, live stock, and equipment investment. On owned land the per cent that the investment in wheat land is of this total investment represents the proportion of the total farm taxes and insurance that has been charged to the wheat land. On rented farms, land taxes and building insurance were paid by the landlord. Any other taxes and insurance were paid by the renter and have been charged against live stock and equipment, wheat receiving its proportionate share through the equipment charge.

The average tax and insurance charge on owned land varied from 25 cents per acre in Morton County, N. Dak., to 95 cents in Saline County, Nebr.

The special crop insurance includes fire insurance on stacked and stored grain and hail insurance on the growing crop. In Morton and Grand Forks Counties there is a State hail insurance tax of 3 cents on each tillable acre owned. Furthermore, there is an additional tax on all acreage insured, the amount of the assessment to be adjusted at the end of the year in the same manner as mutual fire insurance companies.

TABLE XXVII.—*Taxes and insurance, spring and winter wheat, 1919 (481 farms).*

State and county.	Taxes and insurance on owned land.		Special crop insurance.	
	Per cent of farmers owning land.	Cost per acre.	Per cent of farmers reporting.	Average cost per acre insured.
North Dakota:				
Grand Forks County	62	$0.53	100	$0.18
Morton County	95	.25	100	.21
South Dakota:				
Spink County	72	.62	69	.40
Minnesota:				
Clay County	68	.84	76	.81
Traverse County	86	.53	29	.43
All spring wheat	76	.56	74	.39
Kansas:				
Ford County	72	.30	91	1.21
Pawnee County	53	.54	94	1.32
McPherson County	37	.72	63	.42
Missouri:				
Saline County	73	.70	21	.29
Jasper County	57	.56	63	.15
St. Charles County	82	.53	26	.19
Nebraska:				
Phelps County	47	.48	87	.74
Saline County	77	.95	29	.75
Keith County	56	.37	78	1.43
All winter wheat	62	.52	60	1.00

The largest acre charge for special crop insurance was made in Ford and Pawnee Counties, Kans., and in Keith County, Nebr. In these counties a relatively large hail insurance was carried on the growing crop. (See Table XXVII.)

USE-COST OF TRACTOR.

The annual use-cost of a tractor includes repairs, fuel, oil, interest, taxes and insurance, and depreciation. This yearly cost divided by the total number of days the tractor was used during the year gave the average daily cost of running the tractor. The daily cost multiplied by the number of days the tractor was used on wheat production gave the total tractor use-cost chargeable to wheat. All man labor costs involved in running the tractor have been included under man-labor requirements and do not appear as a tractor charge. Table XXVIII shows the principal work on wheat performed by the tractor and the normal man-labor requirements and costs per acre for these operations. The use of the tractor was more common in the winter wheat than in the spring wheat areas. The highest cost per acre for tractor use occurred in Keith County, Nebr., where over 50 per cent of the men interviewed used the tractor. In this area 30 per cent of the farmers used the tractor for harvesting wheat with the binder and 4 per cent used the tractor for heading wheat. (See fig. 11.)

USE-COST OF OTHER FARM MACHINERY.

The items making up the total charge for use of "other farm machinery" include taxes and insurance, interest on investment, depreciation, and the annual maintenance repairs for this machinery. The total annual farm charge for the use of machinery has been divided between the crop and live-stock enterprises on the farm in proportion to the number of horse hours of work required in their production. In a few instances farm machinery was hired for use in producing the wheat crop and when this was the case the actual cash paid out was considered.

TABLE XXVIII.—*Use cost of tractor and other farm machinery spring and winter wheat, 1919 (481 farms).*

State and county.	Plowing (tractor work).			Disking (tractor work).			Harrowing (tractor work).			Cutting (tractor work).			Annual use-cost of other farm machinery.
	Per cent reporting.	Hours per acre.	Cost per acre.	Per cent reporting.	Hours per acre.	Cost per acre.	Per cent reporting.	Hours per acre.	Cost per acre.	Per cent reporting	Hours per acre.	Cost per acre.	
SPRING WHEAT.													
North Dakota:													
Grand Forks County	7.7	1.1	$1.36	......	......	......	......	......	......	......	......	......	$1.50
Morton County	12.8	1.1	1.30	5.1	0.7	$0.45	......	......	......	......	......	......	1.98
South Dakota:													
Spink County	15.0	1.0	1.34	2.5	.5	.50	......	......	......	7.5	0.4	$0.47	1.36
Minnesota:													
Clay County	25.6	1.1	1.37	10.3	.6	.52	20.5	0.3	$0.41	5.1	.2	.50	1.30
Traverse County	11.9	1.2	1.31	4.8	.6	.53	4.8	.2	.26	7.1	.5	.43	1.43
WINTER WHEAT.													
Kansas:													
Ford County	9.0	.9	1.36	3.1	.3	.65	......	......	......	9.4	.5	.49	1.15
Pawnee County	12.5	1.1	1.59	3.1	.8	.65	6.2	.2	.21	15.6	.6	.50	1.32
McPherson County	20.0	1.1	1.28	......	......	......	......	......	......	17.1	.7	.56	1.91
Missouri:													
Saline County	10.0	1.2	1.30	6.9	1.2	.60	......	......	......	6.9	.7	.41	1.51
Jasper County	16.7	2.0	1.46	3.3	.7	.60	3.3	.3	.25	......	......	......	1.77
St. Charles County	31.6	1.6	1.50	7.9	.8	.73	5.3	.3	.30	10.5	.6	.45	2.13
Nebraska:													
Phelps County	6.7	.7	.97	......	......	......	......	......	......	6.7	.4	.48	1.23
Saline County	17.1	1.3	1.43	......	......	......	......	......	......	2.9	.6	.50	1.93
Keith County	47.8	.9	1.34	30.4	.8	.48	4.3	.4	.35	30.4	.3	.48	1.68

LOSS ON ABANDONED WHEAT ACREAGE.

On some farms visited a part of the acreage seeded to wheat was not harvested because the crop was destrayed or in such condition that it was not worth cutting. All costs for labor, seed, manure, use of land, unless recropped, taxes and insurance, etc., expended on this acreage make up the charge "Loss on abandoned wheat acreage." When pastured, credit has been given for the value of the pasture. The total cost of all abandoned acreage in a region, divided by the acreage harvested, is the average abandoned acreage cost per harvested acre. (See Table XXIX.)

In South Dakota, Minnesota, St. Charles County, Mo., and Keith County, Nebr., no abandoned acreage was reported, while in the other areas from 0.5 to 8.2 per cent of the wheat acreage was not harvested.

SACK RENT.

During thrashing in Saline and St. Charles counties, Mo., a part of the wheat was sacked and stored on the farm until thrashing was over, or hauled direct to local elevators. In many instances the farmers did not own sufficient sacks and rented additional ones. The rent for the use of these amounted to about 4 cents per sack, and the acre charge for sack rent averaged about 7 cents an acre for each county.

TABLE XXIX.—*Loss due to abandoned wheat acreage, spring and winter wheat—1919 (481 farms).*

State and county.	Per cent of farms reporting abandoned acreage.	Acres seeded.	Acres harvested.	Per cent of total acreage abandoned.	Average cost per acre abandoned.
North Dakota:					
Grand Forks County	28	10,959	10,060	8.20	$10.87
Morton County	28	6,312	5,840	7.48	11.64
South Dakota:					
Spink County	....	9,500	9,500	....	....
Minnesota:					
Clay County	....	10,376	10,376	....	....
Traverse County	....	7,071	7,071	....	....
All spring wheat	11	44,218	42,847	3.10	11.14
Kansas:					
Ford County	19	10,164	9,817	3.41	6.83
Pawnee County	16	9,282	9,092	2.05	8.53
McPherson County	34	4,990	4,652	6.77	9.52
Missouri:					
Saline County	31	2,523	2,362	6.38	13.26
Jasper County	10	2,960	2,949	.37	16.43
St. Charles County	....	3,035	3,035	....	....
Nebraska:					
Phelps County	30	4,573	4,404	3.70	8.46
Saline County	3	2,018	2,008	.50	29.73
Keith County	....	4,395	4,395	....	....
All winter wheat	16	43,940	42,714	2.79	9.18

OVERHEAD.

In addition to items of expense such as labor, seed, twine, thrashing, etc., which are directly chargeable to wheat, there are certain items of general farm expense that are not only an essential part of the wheat account, but also a part of the cost of every other crop and each kind of live stock produced. This list contains such items as interest and taxes on barn lots, fence rows, roads, etc., building and fence repairs and maintenance, and miscellaneous cash expenses. It is generally considered that these items of farm expense can be handled best by allowing this miscellaneous cost to represent a certain per cent of the combined material and labor costs of each enterprise. Detailed cost-accounting records as kept on representative wheat farms in several of the areas visited show that this charge amounts to approximately 12 per cent of the value of labor, materials, and thrashing. Since the type of farming in the districts studied is so similar, this rate has been used for all farms.

CREDITS.

The items which have been considered as a credit to the wheat crop are straw, pasture, and special insurance received for damage to the crop through fire or hail. The straw was considered of very little money value and often only that portion needed for bedding was saved; the remainder was left to rot or was burned in stacks in the field.

In the winter-wheat areas some farmers pastured the young wheat during the fall and spring months. This was especially true in Kansas and Missouri. In Saline County, Mo., the high credit for pasture was largely due to a considerable area being so badly lodged that it was not cut, but was pastured with hogs.

In only a few instances was insurance reported as having been received for losses owing to fire or hail. (See Table XXX.)

TABLE XXX.—*Credit per acre, spring and winter wheat—1919 (481 farms).*

State and county.	Straw.	Pasture.	Special crop insurance received.	Total.
North Dakota:				
Grand Forks County	$0.19			$0.19
Morton County	.44		$0.06	.50
South Dakota:				
Spink County	.19			.19
Minnesota:				
Clay County	.58			.58
Traverse County	.30			.30
All spring wheat	.34		.01	.35
Kansas:				
Ford County	.30	$0.38	.03	.71
Pawnee County	.18	.98	.13	1.29
McPherson County	.42	.26		.68
Missouri:				
Saline County	.48	1.79		2.27
Jasper County	.57	.41	.16	1.14
St. Charles County	.49	.02		.51
Nebraska:				
Phelps County	.20	.07		.27
Saline County	.34			.34
Keith County	.14		.12	.26
All winter wheat	.30	.46	.06	.82

ARRAY OF FARMS ACCORDING TO COST PER BUSHEL, BY COUNTIES.

In some counties the variation in cost per bushel was much greater than in others. This is brought out in Table XXXI for spring-wheat farms and in Table XXXII for winter-wheat farms.

Of the 29 spring-wheat farms having a cost of $2 or less, nearly 83 per cent were located in Grand Forks County, N. Dak., and Spink County, S. Dak.

TABLE XXXI.—*Array of farms according to cost per bushel, by counties, spring wheats, 1919 (197 farms).*

Cost group.	North Dakota.		South Dakota.	Minnesota.		Total.	Cumulative per cent of all farms.
	Grand Forks County.	Morton County.	Spink County.	Clay County.	Traverse County.		
Per bushel.	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	
$1.10	....	....	1	....	....	1	0.5
1.20	....	....	....	....	....	....	.5
1.30	1	....	....	....	....	1	1.0
1.40	....	....	....	....	....	....	1.0
1.50	1	....	....	....	....	1	1.5
1.60	1	1	1	....	....	3	3.0
1.70	2	....	1	....	....	3	4.5
1.80	1	....	3	....	....	4	6.5
1.90	4	....	2	1	1	8	10.6
2.00	3	1	3	....	1	8	14.7
2.10	3	....	1	3	1	8	18.8
2.20	[a] 5	....	2	1	2	10	23.9
2.30	4	1	2	1	3	11	29.5
2.40	1	....	[a] 3	1	5	10	34.6
2.50	1	....	2	1	3	7	38.2
2.60	4	....	3	3	3	[a] 13	44.8
2.70	1	....	3	7	1	12	50.9
2.80	....	1	1	[a] 1	[a] 5	8	55.0
2.90	1	....	1	1	3	6	58.1
3.00	1	2	2	....	2	7	61.7
3.10	....	....	1	....	2	3	63.2
3.20	....	....	....	....	3	3	64.7
3.30	1	3	1	....	1	6	67.8
3.40	1	1	1	2	....	5	70.3
3.50	....	1	....	3	2	6	73.4
3.60	....	1	....	....	1	2	74.4
3.70	....	....	1	2	....	3	75.9
3.80	....	1	....	3	....	4	77.9
3.90	....	3	1	....	1	5	80.5
4.00	....	....	....	....	....	....	80.5
4.10	....	....	1	1	....	2	81.5
4.20	....	2	....	1	1	4	83.5
4.30	....	[a] 1	....	1	....	2	84.5
4.40	....	....	....	3	....	3	86.0
4.50	....	....	2	1	....	3	87.5
4.60	1	2	....	....	....	3	89.0
4.70	....	3	....	....	....	3	90.5
4.80	....	....	....	....	....	....	90.5
4.90	....	1	....	....	1	2	91.5
5.00	1	....	....	1	....	2	92.5
5.30	....	2	....	....	....	2	93.5
5.60	....	2	....	....	....	2	94.5
5.70	....	1	....	....	....	1	95.0
6.00	....	2	....	....	....	2	96.0
6.10	1	....	....	....	....	1	96.5
6.40	....	1	....	....	....	1	97.0
8.30	....	1	....	....	....	1	97.5
8.70	....	1	....	....	....	1	98.0
10.20	....	1	....	....	....	1	98.5
10.40	....	1	....	....	....	1	99.0
12.10	....	1	....	....	....	1	99.5
14.40	....	1	....	....	....	1	100.0
Total....	39	39	39	38	42	197	....

[a] Average cost group.

TABLE XXXII.—*Array of farms according to cost per bushel, by counties, winter wheat 1919 (284 farms).*

Cost group.	Kansas.			Missouri.			Nebraska.			Total.	Cumulative per cent of all farms.
	Ford County.	Pawnee County.	McPherson County.	Saline County.	Jasper County.	St. Charles County.	Phelps County.	Saline County.	Keith County.		
Per bushel.	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	*Farms.*	
$1.00	1	....	....	....	....	....	....	....	1	2	0.7
1.10	2	1	....	....	....	....	....	....	....	3	1.8
1.20	1	1	....	1	....	1	....	....	1	5	3.6
1.30	2	2	....	....	....	1	....	....	3	8	6.4
1.40	1	4	....	....	1	1	....	1	2	10	9.9
1.50	1	2	....	2	5	7	....	....	3	20	16.9
1.60	4	*a* 4	....	....	2	4	1	1	*a* 2	18	23.2
1.70	4	4	1	1	3	*a* 6	....	1	3	23	31.3
1.80	*a* 1	5	1	2	*a* 3	4	2	1	2	21	38.7
1.90	....	3	5	6	6	3	3	2	2	*a* 30	49.3
2.00	2	....	1	1	6	5	3	4	3	25	58.1
2.10	1	1	3	1	1	4	3	8	....	22	65.8
2.20	1	2	3	*a* 1	3	1	(*a*)	*a* 4	....	15	71.1
2.30	1	1	2	3	....	....	1	2	....	10	74.6
2.40	2	....	*a* 2	....	....	1	4	3	....	12	78.8
2.50	2	....	5	....	....	....	4	1	....	12	83.0
2.60	....	....	1	....	....	....	1	3	....	5	84.8
2.70	2	1	3	3	....	....	1	1	....	11	88.7
2.80	....	....	....	1	....	....	3	1	....	5	90.5
2.90	....	....	....	1	....	....	1	1	....	3	91.6
3.00	....	....	1	1	....	....	....	....	....	2	92.3
3.10	....	....	2	1	....	....	....	....	1	4	93.7
3.20	1	....	1	....	....	....	....	....	....	2	94.4
3.30	....	....	1	1	....	....	....	....	....	2	95.1
3.40	....	....	....	....	....	....	1	....	....	1	95.4
3.50	....	....	1	....	....	....	1	....	....	2	96.1
3.60	....	1	....	....	....	....	1	1	....	3	97.2
3.70	....	....	....	1	....	....	....	....	....	1	97.5
3.80	....	....	1	....	....	....	....	....	....	1	97.8
3.90	....	....	1	....	....	....	....	....	....	1	98.1
4.00	....	....	....	....	....	....	....	....	....	....	98.1
4.10	....	....	....	1	....	....	....	....	....	1	98.4
4.20	....	....	....	....	....	....	....	....	....	....	98.4
4.30	1	....	....	....	....	....	....	....	....	1	98.8
5.10	1	....	....	....	....	....	....	....	....	1	99.2
5.20	....	....	....	1	....	....	....	....	....	1	99.6
8.20	1	....	....	....	....	....	....	....	....	1	100.0
Total.	32	32	35	29	30	38	30	35	23	284	....

a Average cost group.

Of the 15 farms having costs in excess of $5 per bushel, all but one were in Morton County, N. Dak. This means that nearly 36 per cent of the farmers visited in Morton County produced wheat at a cost above that of all the farmers but one visited in the other four counties. Going still further, it was found that less than 8 per cent of the Morton County farmers produced wheat at a cost of $2.70 and less per bushel, while approximately 82 per cent of the farmers visited in Grand Forks County, 69 per cent in Spink County, and 47 per cent in Clay and Traverse Counties had costs of $2.70 and less per bushel.

In the winter-wheat districts, 14 of the 24 farms with costs of $3 and over appeared in McPherson County, Kans., and Saline County, Mo. Considering the winter-wheat areas as a whole, 58 per cent of the winter-wheat farmers produced wheat at a cost of $2 and less. Yet this percentage was much less in some counties and much greater in others. The approximate per cent of farmers in each county who grew their wheat at a cost of $2 and less is as follows: Ford County, Kans., 59; Pawnee County, Kans., 81; McPherson County, Kans., 23; Saline County, Mo., 45; Jasper County, Mo., 87; St. Charles County, Mo., 84; Phelps County, Nebr., 30; Saline County, Nebr., 29; and Keith County, Nebr., 96. As a class the winter-wheat farmers visited in 1919 had a better wheat year than did the spring-wheat farmers. In fact, about 80 per cent of the winter-wheat farmers had costs ranging from $1.30 to $2.50 per bushel, whereas but 38 per cent of the spring-wheat farmers had costs within this range.

CUMULATIVE PER CENT OF ACREAGE GROWN AT VARIOUS COSTS PER BUSHEL.

In Tables XXXIII and XXXIV the farms are grouped according to costs per bushel so as to show the per cent of the total wheat acreage that was grown at various costs, by counties. In the spring-wheat areas between 52 and 57 per cent of the total wheat acreage of the 197 farms was grown at a cost not exceeding $2.65 per bushel, or the average for all farms. However, 79.3 per cent of the Grand Forks acreage was grown at $2.60 and less per bushel, whereas but 6.5 per cent of the Morton County acreage came in this class.

In the winter-wheat districts between 50 and 54 per cent of the total acreage was grown at a cost of $1.87 or less per bushel, the average for all farms. This figure varied from 15.8 per cent in Saline County, Nebr., to 84 per cent in Pawnee County, Kans.

Thus in some counties the average cost per bushel for the entire acreage of spring wheat or winter wheat covers a high percentage of acreage grown, while in other counties a very small part of the acreage was grown at the average cost.

TABLE XXXIII.—*Cumulative per cent of total wheat acreage grown at various costs per bushel, by counties, spring wheat, 1919 (197 farms).*

Cost group.	Cumulative per cent of harvested acreage.					
	Grand Forks County, N. Dak.	Morton County, N. Dak.	Spink County, S. Dak.	Clay County, Minn.	Traverse County, Minn.	All farms.
Per bushel.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
$1.10	....	....	0.6	....	....	0.1
1.20	....	....	.6	....	....	.1
1.30	3.7	....	.6	....	....	1.0
1.40	3.7	....	.6	....	....	1.0
1.50	6.5	....	.6	....	....	1.7
1.60	10.0	0.6	5.3	....	....	3.6
1.70	12.6	.6	7.7	....	....	4.7
1.80	18.1	.6	21.5	....	....	9.1
1.90	26.9	.6	27.8	0.8	1.7	13.0
2.00	32.8	1.7	32.6	.8	2.3	15.7
2.10	43.2	1.7	33.2	5.9	3.7	19.8
2.20	51.4	1.7	39.5	7.1	7.8	24.1
2.30	63.4	6.5	42.1	27.1	17.4	34.6
2.40	64.9	6.5	51.6	28.4	26.7	38.9
2.50	66.5	6.5	56.9	31.5	31.9	42.0
2.60	79.3	6.5	63.1	48.7	40.8	52.0
[a] 2.65	....	....	....	....	....	....
2.70	80.3	6.5	69.3	59.4	45.0	55.9
2.80	80.3	7.2	70.4	61.7	57.4	59.8
2.90	85.9	7.2	72.5	64.6	65.1	63.5
3.00	88.5	10.9	75.4	64.6	68.7	65.8
3.10	88.5	10.9	77.6	64.6	74.7	67.3
3.20	88.5	10.9	77.6	64.6	81.8	68.5
3.30	90.4	24.1	83.1	64.6	82.7	72.1
3.40	93.4	32.2	86.5	66.4	82.7	75.1
3.50	93.4	35.8	86.5	75.2	88.4	78.7
3.60	93.4	40.3	86.5	75.2	91.4	79.8
3.70	93.4	40.3	88.3	77.9	91.4	80.8
3.80	93.4	41.5	88.3	87.6	91.4	83.3
3.90	93.4	44.8	90.0	87.6	94.2	84.6
4.00	93.4	44.8	90.0	87.6	94.2	84.6
4.10	93.4	44.8	93.4	88.3	94.2	85.5
4.20	93.4	48.0	93.4	88.8	99.3	86.9
4.30	93.4	49.7	93.4	90.5	99.3	87.6
4.40	93.4	49.7	93.4	96.6	99.3	89.1
4.50	93.4	49.7	100.0	97.9	99.3	90.9
4.60	94.9	54.0	....	97.9	99.3	91.9
4.70	94.9	62.6	....	97.9	99.3	93.1
4.80	94.9	62.6	....	97.9	99.3	93.1
4.90	94.9	64.3	....	97.9	100.0	93.5
5.00	95.5	64.3	....	100.0	....	94.1
5.30	95.5	69.6	....	....	....	94.8
5.60	95.5	73.8	....	....	....	95.4
5.70	95.5	76.7	....	....	....	95.8
6.00	95.5	83.8	....	....	....	96.8
6.10	100.0	83.8	....	....	....	97.8
6.40	....	87.7	....	....	....	98.3
8.30	....	88.7	....	....	....	98.4
8.70	....	89.4	....	....	....	98.5
10.20	....	90.8	....	....	....	98.7
10.40	....	94.3	....	....	....	99.2
12.10	....	95.7	....	....	....	99.4
14.40	....	100.0	....	....	....	100.0

[a] Average cost per bushel for all spring wheat.

TABLE XXXIV.—*Cumulative per cent of total wheat acreage grown at various costs per bushel, by counties, winter wheat, 1919 (284 farms).*

Cost group.	Cumulative per cent of harvested acreage.									
	Ford County, Kans.	Pawnee County, Kans.	McPherson County, Kans.	Saline County, Mo.	Jasper County, Mo.	St. Charles County, Mo.	Phelps County, Nebr.	Saline County, Nebr.	Keith County, Nebr.	All farms.
Per bush.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
$1.00	3.3	....	....	....	....	....	....	....	10.2	1.8
1.10	7.5	5.2	....	....	....	....	....	....	10.2	3.9
1.20	8.5	6.7	....	3.8	....	3.0	....	....	11.7	5.0
1.30	16.6	10.8	....	3.8	....	7.7	....	....	22.1	9.1
1.40	20.4	23.1	....	3.8	4.9	10.9	....	2.5	30.1	14.1
1.50	24.3	29.7	....	7.0	18.7	28.5	....	2.5	50.6	20.9
1.60	34.7	41.3	....	7.0	22.4	38.8	2.7	5.2	54.4	27.6
1.70	43.9	63.5	1.4	11.2	36.0	51.8	2.7	6.7	60.0	37.3
1.80	47.1	77.0	2.8	25.0	50.6	60.7	9.2	9.1	67.7	45.0
[a] 1.87										
1.90	47.1	84.2	16.1	45.9	72.1	68.2	24.5	15.8	78.8	54.2
2.00	55.3	84.2	19.8	48.9	92.5	79.8	44.9	27.0	99.6	63.6
2.10	59.8	86.8	26.0	51.2	95.0	89.8	53.9	47.3	99.6	68.8
2.20	62.2	92.8	34.7	54.8	100.0	92.4	53.9	60.9	99.6	72.9
2.30	66.5	95.5	44.8	67.9	....	92.4	57.3	66.4	99.6	76.9
2.40	71.1	95.5	50.9	67.9	....	100.0	67.0	78.5	99.6	80.7
2.50	76.9	95.5	68.9	67.9	....	....	77.1	81.7	99.6	85.2
2.60	76.9	95.5	73.2	67.9	....	....	80.0	92.2	99.6	86.5
2.70	87.8	97.7	81.6	77.2	....	....	82.7	94.0	99.6	91.3
2.80	87.8	97.7	81.6	80.0	....	....	87.5	95.0	99.6	92.0
2.90	87.8	97.7	81.6	87.4	....	....	89.3	97.5	99.6	92.7
3.00	87.8	97.7	84.7	89.0	....	....	89.3	97.5	99.6	93.1
3.10	87.8	97.7	89.9	90.3	....	....	89.3	97.5	100.0	93.8
3.20	90.9	97.7	92.5	90.3	....	....	89.3	97.5	....	94.8
3.30	90.9	97.7	93.0	93.0	....	....	89.3	97.5	....	95.0
3.40	90.9	97.7	93.0	93.0	....	....	93.9	97.5	....	95.5
3.50	90.9	97.7	94.3	93.0	....	....	96.6	97.5	....	95.9
3.60	90.9	100.0	94.3	93.0	....	....	100.0	100.0	....	96.9
3.70	90.9	....	94.3	96.2	....	....	....	....	....	97.1
3.80	90.9	....	96.1	96.2	....	....	....	....	....	97.3
3.90	90.9	....	100.0	96.2	....	....	....	....	....	97.7
4.00	90.9	....	....	96.2	....	....	....	....	....	97.7
4.10	90.9	....	....	98.3	....	....	....	....	....	97.8
4.20	90.9	....	....	98.3	....	....	....	....	....	97.8
4.30	93.4	....	....	98.3	....	....	....	....	....	98.4
5.10	96.5	....	....	....	....	....	....	....	....	99.1
5.20	....	....	....	100.0	....	....	....	....	....	99.2
8.20	100.0	....	....	....	....	....	....	....	....	100.0

[a] Average cost per bushel for all winter wheat.

CUMULATIVE PER CENT OF TOTAL PRODUCTION.

Tables XXXV and XXXVI show the cumulative per cent of total production with reference to cost per bushel.

In the spring-wheat areas about 67 per cent of the total bushels harvested was grown on farms havings costs not in excess of the general average of $2.65 per bushel. This percentage varied in different counties. In Grand Forks County, 87 per cent of the production was grown at a cost of $2.60 or less, but in Morton County only 13.3 per cent was produced as cheaply as $2.60 per bushel.

In the winter-wheat districts approximately 60 per cent of the total production was raised at the average cost or less per bushel. As in the spring-wheat districts, the cumulative per cent of production grown at various costs per bushel showed considerable variation among the various districts visited.

TABLE XXXV.—*Cumulative per cent of total production, by counties, spring wheat, 1919 (197 farms).*

Cost group.	Cumulative per cent of production.					
	Grand Forks County, N. Dak.	Morton County, N. Dak.	Spink County, S. Dak.	Clay County, Minn.	Traverse County, Minn.	All farms.
Per bushel.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
$1.10			1.3			0.3
1.20			1.3			.3
1.30	5.9		1.3			1.9
1.40	5.9		1.3			1.9
1.50	10.7		1.3			3.2
1.60	15.0	1.2	8.6			6.4
1.70	17.9	1.2	12.1			8.1
1.80	24.6	1.2	31.4			14.9
1.90	35.4	1.2	39.2	1.6	2.3	20.6
2.00	42.9	2.9	45.1	1.6	3.3	24.5
2.10	54.7	2.9	45.9	8.8	4.9	29.8
2.20	62.4	2.9	52.6	10.6	10.3	34.9
2.30	74.4	13.3	55.3	35.6	20.4	47.1
2.40	76.1	13.3	62.5	37.3	30.9	51.5
2.50	77.6	13.3	67.2	40.7	37.0	54.9
2.60	86.9	13.3	72.3	57.8	46.4	64.3
[a] 2.65						
2.70	88.1	13.3	77.6	69.5	50.1	69.3
2.80	88.1	14.1	78.5	71.9	63.1	72.3
2.90	91.8	14.1	79.7	74.7	71.1	75.6
3.00	93.8	19.0	82.1	74.7	74.6	77.7
3.10	93.8	19.0	84.3	74.7	79.7	79.1
3.20	93.8	19.0	84.3	74.7	85.9	80.1
3.30	94.9	33.2	89.2	74.7	86.8	82.8
3.40	96.7	43.4	91.8	76.6	86.8	85.1
3.50	96.7	47.3	91.8	82.8	91.5	87.6
3.60	96.7	53.4	91.8	82.8	94.0	88.5
3.70	96.7	53.4	92.9	84.7	94.0	89.2
3.80	96.7	54.4	92.9	91.5	94.0	90.9
3.90	96.7	58.5	93.9	91.5	95.5	91.7
4.00	96.7	58.5	93.9	91.5	95.5	91.7
4.10	96.7	58.5	96.2	92.0	95.5	92.4
4.20	96.7	61.9	96.2	92.4	99.2	93.3
4.30	96.7	63.8	96.2	93.9	99.2	93.8
4.40	96.7	63.8	96.2	97.7	99.2	94.7
4.50	96.7	63.8	100.0	98.6	99.2	95.9
4.60	97.5	67.7		98.6	99.2	96.4
4.70	97.5	73.9		98.6	99.2	96.8
4.80	97.5	73.9		98.6	99.2	96.8
4.90	97.5	75.7		98.6	100.0	97.1
5.00	97.9	75.7		100.0		97.5
5.30	97.9	81.5				97.9
5.60	97.9	84.4				98.1
5.70	97.9	87.6				98.3
6.00	97.9	92.7				98.7
6.10	100.0	92.7				99.2
6.40		95.3				99.4
8.30		96.1				99.5
8.70		96.6				99.6
10.20		97.4				99.7
10.40		98.6				99.8
12.10		99.1				99.9
14.40		100.0				100.0

[a] Average cost per bushel for all spring wheat.

Table XXXVI.—*Cumulative per cent of total production, by counties, winter wheat, 1919 (284 farms).*

Cost group.	Cumulative per cent of total production.									
	Ford County, Kans.	Pawnee County, Kans.	McPherson County, Kans.	Saline County, Mo.	Jasper County, Mo.	St. Charles County, Mo.	Phelps County, Nebr.	Saline County, Nebr.	Keith County, Nebr.	All farms.
Per bush.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
$1.00	4.2	....	....	....	....	....	....	....	11.3	2.3
1.10	11.3	6.9	....	....	....	....	....	....	11.3	5.1
1.20	12.8	7.8	....	4.6	....	3.6	....	....	13.4	6.5
1.30	24.9	12.9	....	4.6	....	9.1	....	....	25.1	12.0
1.40	31.1	28.5	....	4.6	5.2	12.5	....	3.0	34.5	18.5
1.50	37.2	35.9	....	9.0	20.4	33.6	....	3.0	55.6	27.5
1.60	52.1	48.5	....	9.0	24.1	43.6	4.3	6.4	58.6	35.2
1.70	61.0	69.2	1.8	15.2	38.3	56.8	4.3	8.3	64.9	45.1
1.80	64.6	82.7	3.8	31.4	53.3	65.7	11.4	11.0	72.8	53.6
1.87[a]										
1.90	64.6	89.7	22.1	54.9	74.0	73.8	30.4	18.6	83.5	63.9
2.00	74.5	89.7	25.7	58.2	92.9	85.0	54.1	30.6	99.8	73.7
2.10	77.3	91.7	31.8	60.6	95.4	93.0	64.5	51.8	99.8	78.4
2.20	78.9	96.3	41.2	65.4	100.0	95.0	64.5	66.0	99.8	82.2
2.30	82.9	97.9	52.1	75.5	....	95.0	68.0	71.5	99.8	85.5
2.40	86.3	97.9	58.2	75.5	....	100.0	76.4	82.2	99.8	88.5
2.50	90.4	97.9	76.1	75.5	....	....	84.8	85.2	99.8	91.8
2.60	90.4	97.9	80.8	75.5	....	....	86.7	94.5	99.8	92.9
2.70	96.8	99.2	88.0	84.3	....	....	89.1	95.9	99.8	95.9
2.80	96.8	99.2	88.0	86.2	....	....	93.1	96.7	99.8	96.4
2.90	96.8	99.2	88.0	92.6	....	....	94.4	98.6	99.8	97.0
3.00	96.8	99.2	90.4	93.6	....	....	94.4	98.6	99.8	97.3
3.10	96.8	99.2	94.1	94.5	....	....	94.4	98.6	100.0	97.7
3.20	98.1	99.2	95.5	94.5	....	....	94.4	98.6	....	98.1
3.30	98.1	99.2	96.0	96.7	....	....	94.4	98.6	....	98.3
3.40	98.1	99.2	96.0	96.7	....	....	97.0	98.6	....	98.5
3.50	98.1	99.2	96.9	96.7	....	....	98.4	98.6	....	98.7
3.60	98.1	100.0	96.9	96.7	....	....	100.0	100.0	....	99.1
3.70	98.1	....	96.9	98.2	....	....	....	....	....	99.2
3.80	98.1	....	97.9	98.2	....	....	....	....	....	99.3
3.90	98.1	....	100.0	98.2	....	....	....	....	....	99.5
4.00	98.1	....	....	98.2	....	....	....	....	....	99.5
4.10	98.1	....	....	99.2	....	....	....	....	....	99.6
4.20	98.1	....	....	....	....	....	....	....	....	99.6
4.30	98.7	....	....	....	....	....	....	....	....	99.7
5.10	99.4	....	....	....	....	....	....	....	....	99.8
5.20	....	....	....	100.0	....	....	....	....	....	99.9
8.20	100.0	....	....	....	....	....	....	....	....	100.0

[a] Average cost per bushel for all winter wheat.

INDIVIDUAL COSTS PER ACRE.

Table XXXVII shows costs per acre for each of the owned farms covered by the survey.

TABLE XXXVII.—*Individual costs per acre on owned land, spring and winter wheat, 1919 (327 farms).*

Record number.	Acres harvested.	Factors of cost, per acre.								Total net cost, with rent.		Yield per acre.
		Labor.	Material.	Thrashing.	Miscellaneous.	Total gross cost, without rent.	Credit.	Total net cost, without rent.	Rent (interest on investment).	Per acre.	Per bushel.	
SPRING WHEAT.												
GRAND FORKS COUNTY, N. DAK.												
1	375	$6.25	$3.59	$2.72	$3.22	$15.78	......	$15.78	$3.60	$19.38	$1.26	15.4
2	280	7.43	4.63	3.21	5.12	20.39	$0.36	20.03	5.40	25.43	1.52	16.7
3	260	3.63	3.60	2.88	3.92	14.03	.50	13.53	6.00	19.53	1.63	12.0
4	173	6.59	4.67	3.58	3.95	18.79	......	18.79	3.60	22.39	1.64	13.7
5	200	5.42	3.47	3.67	3.29	15.85	......	15.85	2.40	18.25	1.66	11.0
6	180	8.88	4.66	3.19	4.66	21.39	......	21.39	4.50	25.89	1.71	11.9
7	65	4.84	3.94	2.12	3.08	13.98	.46	13.52	5.40	18.92	1.72	11.0
8	63	9.37	3.94	4.00	4.86	22.17	.63	21.54	4.50	26.04	1.75	14.9
9	553	7.02	4.27	2.25	3.50	17.04	.09	16.95	4.20	21.15	1.76	12.0
10	475	5.66	3.80	3.18	3.40	16.04	......	16.04	6.00	22.04	1.87	11.8
11	236	8.07	4.26	3.18	4.76	20.27	.21	20.06	4.50	24.56	1.88	13.1
12	110	6.53	3.99	2.24	3.35	16.11	......	16.11	5.40	21.51	1.89	11.4
13	65	7.54	4.10	2.07	4.46	18.17	.77	17.40	4.20	21.60	1.92	11.3
14	200	5.58	4.15	3.92	5.22	18.87	.17	18.70	3.30	22.00	1.95	11.3
15	80	5.83	3.19	1.75	3.34	14.11	......	14.11	5.40	19.51	2.08	9.4
16	410	5.55	2.81	3.66	4.40	16.42	......	16.42	5.40	21.82	2.14	10.2
17	90	6.30	3.28	2.78	3.97	16.33	......	16.33	5.40	21.73	2.24	9.7
18	300	8.06	4.01	4.77	5.20	22.04	.17	21.87	5.10	26.97	2.34	11.5
61	295	5.37	4.47	1.87	3.44	15.15	.30	14.85	5.10	19.95	2.67	7.5
20	160	6.61	3.76	2.25	3.73	16.35	......	16.35	7.50	23.85	2.98	8.0
21	300	6.25	4.22	2.50	4.44	17.41	.20	17.21	3.00	20.21	3.37	6.0
22	15	6.63	4.19	3.82	3.53	18.17	2.33	15.84	3.60	19.44	3.89	5.0
23	155	7.69	4.63	2.58	5.40	20.30	.32	19.98	3.60	23.58	4.57	5.2
24	450	5.46	4.57	2.22	10.18	22.43	.89	21.54	6.00	27.54	6.12	4.5
MORTON COUNTY, N. DAK.												
1	35	$6.13	$2.84	$0.81	$3.11	$12.89	$1.14	$11.75	$2.40	$14.15	$1.64	8.6
2	63	6.33	2.05	.59	3.76	12.73	.71	12.02	2.10	14.12	2.03	6.9
3	12	5.51	3.15	.66	3.12	12.44	1.50	10.94	3.00	13.94	2.29	6.1
4	280	10.58	3.83	.93	4.27	19.61	.18	19.43	2.70	22.13	2.29	9.6
5	40	8.22	2.52	.50	3.36	14.60	2.50	12.10	1.80	13.90	2.78	5.0
6	65	11.41	3.68	.64	4.54	20.27	.77	19.50	2.10	21.60	2.99	7.2
7	150	7.23	2.71	.57	4.07	14.58	.53	14.05	2.10	16.15	3.04	5.3
8	275	8.03	3.54	.83	6.45	18.85	.25	18.60	2.10	20.70	3.06	6.8
9	500	4.13	3.14	.33	2.86	10.46	.20	10.26	3.00	13.26	3.19	4.2
10	50	9.65	4.28	.60	9.95	24.48	......	24.48	2.10	26.58	3.32	8.0
11	210	8.99	3.11	.37	3.23	15.70	.31	15.39	1.50	16.89	3.50	4.8
12	260	11.68	3.18	.65	5.00	20.51	.77	19.74	1.80	21.54	3.57	6.0
13	30	9.63	2.92	.64	3.35	16.54	.30	16.24	1.20	17.44	3.74	4.7
14	25	11.64	3.14	.69	6.49	21.96	.28	21.68	1.80	23.48	3.86	6.1
15	120	10.28	4.19	.48	4.68	19.63	1.25	18.38	3.60	21.98	3.92	5.6
16	140	5.54	3.15	.30	4.02	13.01	.27	12.74	1.80	14.54	4.11	3.5
17	40	9.38	3.43	.53	5.04	18.38	.60	17.78	2.40	20.18	4.12	4.9
18	100	8.95	3.38	.46	4.21	17.00	.50	16.50	1.50	18.00	4.23	4.3
19	100	9.34	3.13	.52	5.47	18.46	.75	17.71	3.60	21.31	4.30	5.0
20	150	8.59	4.24	.30	3.27	16.40	.50	15.90	2.40	18.30	4.58	4.0
21	100	8.95	3.34	.36	4.67	17.32	.45	16.87	1.80	18.67	4.60	4.1
22	100	12.09	2.32	.50	5.25	20.16	.18	19.98	1.80	21.78	4.74	4.6
23	100	10.62	3.59	.53	7.41	22.15	1.08	21.07	2.10	23.17	4.88	4.8
24	150	8.79	3.01	.37	15.03	27.20	.80	26.40	1.50	27.90	5.28	5.3
25	160	13.14	3.14	.46	4.79	21.53	.19	21.34	1.50	22.84	5.33	4.3
26	60	7.98	2.52	.25	2.85	13.60	.20	13.40	2.10	15.50	5.57	2.8
27	186	8.07	3.46	.25	4.81	16.59	.67	15.92	2.10	18.02	5.64	3.2
28	170	10.45	4.01	.52	12.36	27.34	1.47	25.87	2.10	27.97	5.68	4.9

TABLE XXXVII.—*Individual costs per acre on owned land, spring and winter wheat, 1919 (327 farms)*—Continued.

Record number.	Acres harvested.	Factors of cost, per acre.								Total net cost, with rent.		Yield per acre.
		Labor.	Material.	Thrashing.	Miscellaneous.	Total gross cost, without rent.	Credit.	Total net cost, without rent.	Rent (interest on investment).	Per acre.	Per bushel.	
SPRING WHEAT—Coctinued.												
MORTON COUNTY, N. DAK.—Continued.												
29	140	$9.31	$3.17	$0.27	$4.82	$17.57	$2.32	$15.25	$2.40	$17.65	$5.98	3.0
30	275	10.75	2.26	.35	5.02	18.38	.45	17.93	2.10	20.03	6.03	3.3
31	100	8.78	4.20	.28	4.04	17.30	.33	16.97	3.00	19.97	6.79	2.9
32	23	6.19	2.70	.18	4.56	13.63	.22	13.41	1.50	14.91	7.45	2.0
33	60	8.79	3.23	.36	16.39	28.77	.83	27.94	1.80	29.74	8.30	3.6
34	80	14.62	4.40	.24	4.74	24.00	.32	23.68	1.50	25.18	10.17	2.5
35	205	7.44	3.28	.24	3.37	14.33	.15	14.18	1.50	15.68	10.44	1.5
36	80	8.55	2.43	.20	7.20	18.38	.75	17.63	3.00	20.63	12.13	1.7
37	250	6.38	3.01	.10	3.01	12.50	.20	12.30	1.50	13.80	14.38	1.0
SPINK COUNTY, S. DAK.												
1	60	$5.82	$3.14	$5.00	$4.30	$18.26	$0.42	$17.84	$6.00	$23.84	$1.15	20.8
2	120	5.97	4.03	3.53	3.33	16.86	....	16.86	6.00	22.86	1.39	16.4
3	60	8.96	3.89	1.11	4.77	18.73	2.25	16.48	6.00	22.48	1.79	12.6
4	135	5.44	3.97	2.95	4.04	16.40	.30	16.10	6.00	22.10	2.01	11.0
5	145	6.73	2.20	3.49	3.65	16.07	.25	15.82	8.10	23.92	2.03	11.8
6	180	8.11	3.13	3.58	4.31	19.13	.05	19.08	7.50	26.58	2.03	13.1
7	60	10.52	3.69	1.35	4.14	19.70	....	19.70	7.50	27.20	2.15	12.7
8	100	4.17	2.99	2.08	4.09	13.33	....	13.33	6.00	19.33	2.18	8.8
9	200	8.18	3.73	2.73	4.22	18.86	.25	18.61	7.50	26.11	2.25	11.6
10	85	6.97	3.10	3.18	4.89	18.14	.59	17.55	9.60	27.15	2.30	11.8
11	163	7.46	3.80	3.04	3.74	18.04	.61	17.43	6.00	23.43	2.39	9.8
12	250	6.79	3.05	2.97	4.54	17.35	....	17.35	9.00	26.35	2.48	10.6
13	85	4.78	3.46	1.91	4.18	14.33	....	14.33	6.00	20.33	2.63	7.7
14	300	5.56	3.43	2.59	4.17	15.75	.33	15.42	9.00	24.42	2.66	9.2
15	100	6.20	2.58	2.92	3.85	15.55	.50	15.05	6.00	21.05	2.68	7.8
16	190	6.68	4.19	1.64	3.17	15.68	.53	15.15	6.00	21.15	2.71	7.8
17	100	4.71	3.04	3.10	4.52	15.37	.25	15.12	9.00	24.12	2.82	8.6
18	75	10.14	5.42	2.35	5.79	23.70	....	23.70	9.00	32.70	3.03	10.8
19	210	7.64	4.08	2.55	4.41	18.68	....	18.68	12.00	30.68	3.10	9.9
20	40	8.39	2.98	2.24	3.70	17.31	....	17.31	5.40	22.71	3.13	7.2
21	100	7.44	3.01	2.36	3.91	16.72	.12	16.60	6.00	22.60	3.30	6.8
22	525	8.26	3.61	4.69	3.74	20.30	.05	20.25	9.00	29.25	3.35	7.8
23	320	6.07	3.04	2.28	5.50	16.89	.47	16.42	9.60	26.02	3.42	7.6
24	160	5.59	3.31	1.97	6.68	17.55	....	17.55	6.00	23.55	3.90	6.0
25	120	8.40	3.26	1.08	3.54	16.28	.50	15.78	7.50	23.28	3.98	5.8
26	320	8.06	3.29	1.78	3.94	17.07	.25	16.82	10.50	27.32	4.11	6.6
27	300	11.94	3.48	1.16	4.20	20.78	.33	20.45	7.50	27.95	4.49	6.2
28	330	5.76	3.31	3.28	3.50	15.85	.25	15.60	7.50	23.10	4.54	5.1
CLAY COUNTY, MINN.												
1	58	$6.89	$4.45	$0.96	$3.78	$16.08	$0.26	$15.82	$7.50	$23.32	$1.54	15.1
2	80	9.86	5.18	3.45	5.76	24.25	.31	23.94	7.50	31.44	1.90	16.6
3	160	9.46	5.50	1.76	4.80	21.52	.13	21.39	6.00	27.39	2.08	13.2
4	127	8.09	3.72	1.16	4.48	17.45	....	17.45	9.00	26.45	2.19	12.1
5	85	5.84	3.66	1.10	4.32	14.92	.16	14.76	6.00	20.76	2.42	8.6
6	35	5.32	3.81	.92	4.15	14.20	.11	14.09	12.00	26.09	2.47	10.6
7	900	5.68	4.25	.85	3.35	14.13	1.39	12.74	9.00	21.74	2.62	8.3
8	120	10.02	5.82	1.56	6.14	23.54	.21	23.33	9.00	32.33	2.69	12.0
9	110	9.19	4.27	1.46	4.47	19.39	.45	18.94	12.00	30.94	2.71	11.4
10	930	4.64	4.64	1.20	6.41	16.89	.48	16.41	12.00	28.41	2.80	10.2
11	240	7.82	3.95	1.25	3.98	17.00	.42	16.58	6.60	23.18	2.81	8.2
12	300	9.36	3.74	.97	3.55	17.62	.17	17.45	6.00	23.45	2.93	8.0
13	90	10.30	4.60	1.27	4.53	20.70	.56	20.14	6.00	26.14	3.36	7.8
14	100	12.81	4.91	1.74	6.34	25.80	.50	25.30	6.00	31.30	3.43	9.1
15	280	6.13	4.36	.79	6.74	18.02	.23	17.79	6.60	24.39	3.48	7.0
16	160	4.36	4.99	.74	6.07	16.16	1.25	14.91	9.00	23.91	3.71	6.4
17	75	8.81	4.58	1.91	4.66	19.96	1.04	18.92	10.50	29.42	3.79	7.8
18	800	8.47	3.67	1.36	3.05	16.55	156	14.99	6.00	20.99	3.83	5.5

TABLE XXXVII.—*Individual costs per acre on owned land, spring and winter wheat, 1919 (327 farms)*—Continued.

Record number.	Acres harvested.	Factors of cost, per acre.								Total net cost, with rent.		Yield per acre.
		Labor.	Material.	Thrashing.	Miscellaneous.	Total gross cost, without rent.	Credit.	Total net cost, without rent.	Rent (interest on invest. ment).	Per acre.	Per bushel.	
SPRING WHEAT—Continued.												
CLAY COUNTY, MINN.—Continued.												
19	70	$8.71	$5.41	$0.94	$3.95	$19.01	....	$19.01	$7.50	$26.51	$4.08	6.5
20	100	8.97	4.07	.93	3.82	17.79	$0.16	17.63	6.00	23.63	4.30	5.5
21	180	11.34	4.24	2.41	6.76	24.75	1.11	23.64	7.50	31.14	4.32	7.2
22	250	10.50	3.90	2.43	3.85	20.68	.20	20.48	6.00	26.48	4.41	6.0
23	130	11.47	6.29	1.43	5.94	25.13	3.08	22.05	7.50	29.55	4.49	6.6
24	220	7.08	3.82	.48	6.38	17.76	.68	17.08	9.00	26.08	5.02	5.2
25	30	7.73	4.48	1.56	3.72	17.49	....	17.49	9.00	26.49	5.30	5.0
26	75	8.12	4.07	1.25	5.31	18.75	.44	18.31	6.00	24.31	6.68	3.6
TRAVERSE COUNTY, MINN.												
1	120	$8.63	$3.48	$1.48	$3.27	$16.86	$0.34	$16.52	$4.80	$21.32	$1.91	11.2
2	97	8.46	3.33	1.29	4.69	17.77	.32	17.45	9.00	26.45	2.02	13.1
3	45	9.99	4.99	1.45	5.08	21.51	....	21.51	5.40	26.91	2.05	13.1
4	100	8.68	4.40	1.30	3.02	17.40	1.60	15.80	4.80	20.60	2.10	9.8
5	70	10.77	4.02	1.41	4.23	20.43	....	20.43	6.00	26.43	2.22	11.9
6	160	8.13	4.76	1.44	4.34	18.67	.94	17.73	7.50	25.23	2.24	11.2
7	30	7.80	4.02	1.04	2.94	15.80	.27	15.53	6.00	21.53	2.27	9.5
8	500	7.99	3.71	.97	2.98	15.65	.30	15.35	4.80	20.15	2.28	8.8
9	70	7.99	4.29	1.60	3.84	17.72	.36	17.36	6.00	23.36	2.31	10.1
10	275	5.11	4.01	.75	5.29	15.16	.45	14.71	6.00	20.71	2.40	8.6
11	33	10.59	4.04	2.45	4.35	21.43	.45	20.98	12.00	32.98	2.44	13.6
12	90	8.86	3.92	.93	5.27	18.98	.20	18.78	7.50	26.28	2.44	10.8
13	100	12.29	4.38	1.57	5.04	23.28	.13	23.15	6.00	29.15	2.50	11.6
14	160	10.18	4.45	1.47	4.46	20.56	.50	20.06	7.80	27.86	2.53	11.0
15	230	8.20	4.47	.90	2.84	16.41	.05	16.36	4.80	21.16	2.61	8.1
16	300	5.90	3.18	.96	4.67	14.71	.67	14.04	6.00	20.04	2.73	7.4
17	50	8.09	4.14	.97	3.57	16.77	.66	16.11	7.50	23.61	2.75	8.6
18	340	10.96	3.48	1.48	3.97	19.89	.15	19.74	7.20	26.94	2.78	9.7
19	165	5.61	3.56	1.13	5.28	15.58	.30	15.28	7.50	22.78	2.78	8.2
20	70	9.86	4.12	.88	3.47	18.33	1.00	17.33	6.00	23.33	2.79	8.4
21	160	9.35	3.55	.98	4.11	17.99	....	17.99	6.00	23.99	2.79	8.6
22	90	11.23	4.63	1.07	4.21	21.14	.39	20.75	7.20	27.95	2.85	9.8
23	40	8.32	3.97	1.66	3.71	17.66	....	17.66	6.00	23.66	2.86	8.3
24	200	10.87	3.70	1.69	4.00	20.26	.25	20.01	4.80	24.81	2.93	8.5
25	200	8.78	4.42	1.13	3.69	18.02	.10	17.92	7.50	25.42	2.94	8.6
26	155	8.77	4.53	1.70	3.50	18.50	....	18.50	9.00	27.50	2.99	9.2
27	225	9.57	3.35	.71	3.61	17.24	....	17.24	6.00	23.24	3.06	7.6
28	230	11.17	4.14	1.17	3.78	20.26	.22	20.04	6.00	26.04	3.18	8.2
29	40	10.83	3.29	2.65	4.03	20.80	.27	20.53	6.00	26.53	3.22	8.2
30	60	12.68	4.04	1.43	4.91	23.06	.42	22.64	7.50	30.14	3.29	9.2
31	100	9.29	4.29	.93	4.13	18.64	1.00	17.64	9.00	26.64	3.46	7.7
32	300	8.25	4.45	.77	2.97	16.44	....	16.44	7.50	23.94	3.54	6.0
33	210	11.04	4.13	.80	4.29	20.26	....	20.26	4.80	25.06	3.58	7.0
34	90	8.03	4.50	1.14	3.16	16.83	.50	16.33	6.00	22.33	3.59	6.2
35	360	8.80	4.40	1.22	4.14	18.56	....	18.56	7.50	26.06	4.24	6.2
36	51	17.73	5.77	2.94	9.65	36.09	.25	35.84	12.00	47.84	4.93	9.7
WINTER WHEAT.												
FORD COUNTY, KANS.												
1	320	$9.29	$2.06	$0.42	$2.48	$14.25	$0.84	$13.41	$3.60	$17.01	$0.98	17.4
2	90	10.30	1.85	4.48	5.08	21.71	2.90	18.81	3.00	21.81	.99	22.0
3	200	13.43	2.68	4.59	5.16	25.86	3.60	22.26	3.60	25.86	1.06	24.3
4	300	8.95	2.53	4.45	5.39	21.32	.54	20.78	4.50	25.28	1.15	22.0
5	220	10.41	2.35	4.00	4.37	21.13	1.73	19.40	3.60	23.00	1.15	20.0
6	100	9.79	2.88	3.49	5.85	22.01	1.20	20.81	3.00	23.81	1.24	19.2
7	335	9.94	2.24	3.10	4.60	19.88	.36	19.52	3.00	22.52	1.26	17.9
8	240	11.15	2.73	4.44	5.65	23.97	....	23.97	4.50	28.47	1.29	22.0
9	190	7.50	1.65	2.20	4.53	15.88	.31	15.57	3.00	18.57	1.29	14.4
10	190	8.87	1.72	3.92	3.37	17.88	.05	17.83	2.40	20.23	1.29	15.7
11	110	9.72	1.64	3.86	5.76	20.98	1.56	19.42	3.00	22.42	1.34	16.8

TABLE XXXVII.—*Individual costs per acre on owned land, spring and winter wheat, 1919 (327 farms)*—Continued.

Record number.	Acres harvested.	Factors of cost, per acre.								Total net cost, with rent.		Yield per acre.
		Labor.	Material.	Thrashing.	Miscellaneous.	Total gross cost, without rent.	Credit.	Total net cost, without rent.	Rent (interest on investment).	Per acre.	Per bushel.	
WINTER WHEAT—Continued.												
FORD COUNTY, KANS.—Continued.												
12	100	$9.41	$1.36	$2.85	$2.44	$16.06	$0.34	$15.72	$2.40	$18.12	$1.41	12.9
13	80	12.35	2.01	2.90	5.36	22.62	2.37	20.25	3.00	23.25	1.55	15.0
14	230	11.89	2.73	3.46	6.23	24.31	.09	24.22	3.00	27.22	1.60	17.0
15	175	11.41	1.73	2.65	4.53	20.32	.20	20.12	3.00	23.12	1.69	13.7
16	105	7.72	2.43	2.10	5.11	17.36	.69	16.67	3.00	19.67	1.90	10.4
17	140	8.48	1.50	2.42	4.23	16.63	1.42	15.21	3.60	18.81	2.09	9.0
18	80	13.74	1.96	1.77	3.88	21.35	.78	20.57	3.60	24.17	2.15	11.2
19	200	13.71	3.29	1.67	4.70	23.37	.70	22.67	3.00	25.67	2.62	9.8
20	250	8.00	1.52	.63	3.24	13.39	1.60	11.79	3.00	14.79	4.35	3.4
21	200	6.61	2.80	.82	2.70	12.93	....	12.93	3.00	15.93	4.90	3.2
22	145	8.78	1.70	.38	3.96	14.82	.31	14.51	2.40	16.91	8.04	2.1
23	70	6.30	1.98	.76	7.92	16.96	.36	16.60	3.00	19.60	13.72	1.4
PAWNEE COUNTY, KANS.												
1	75	$6.91	$2.88	$3.01	$4.40	$17.20	$2.72	$14.48	$6.00	$20.48	$1.05	19.5
2	470	6.46	2.51	3.33	4.26	16.56	1.36	15.20	4.80	20.00	1.08	18.5
3	120	6.07	1.91	3.47	4.41	15.86	.40	15.46	6.00	21.46	1.12	19.2
4	87	8.94	1.78	3.84	4.24	18.80	.06	18.74	4.50	23.24	1.16	20.0
5	135	6.99	3.86	1.33	4.57	16.75	10.70	6.05	4.50	10.55	1.20	8.8
6	140	4.26	2.91	3.46	5.24	15.87	.86	15.01	4.50	19.51	1.37	14.3
7	310	7.92	1.73	3.76	6.89	20.30	1.02	19.28	6.00	25.28	1.44	17.5
8	25	5.99	1.55	3.40	4.95	15.89	.68	15.21	4.50	19.71	1.52	13.0
9	160	8.86	2.03	3.32	3.17	17.38	1.97	15.41	6.00	21.41	1.56	13.8
10	110	6.16	2.49	2.74	4.68	16.07	.45	15.62	6.00	21.62	1.59	13.6
11	400	5.89	3.41	2.50	4.08	15.88	.10	15.78	4.80	20.58	1.66	12.4
12	240	6.96	2.00	2.69	7.27	18.92	1.30	17.62	4.80	22.42	1.67	13.5
13	80	10.84	2.67	3.55	7.29	24.35	1.40	22.95	6.00	28.95	1.70	17.0
14	140	7.28	3.00	2.36	6.13	18.77	1.42	17.35	5.40	22.75	1.75	13.0
15	80	6.92	2.20	2.25	6.16	17.53	1.33	16.20	4.50	20.70	1.88	11.0
16	305	5.75	2.21	1.91	5.59	15.46	.80	14.66	6.00	20.66	2.16	9.5
17	250	5.83	2.05	1.56	4.11	13.55	.09	13.46	4.80	18.26	2.28	8.0
MCPHERSON COUNTY, KANS.												
1	45	$12.90	$4.02	$2.99	$4.09	$24.00	$1.71	$22.29	$7.20	$29.49	$1.68	17.8
2	33	11.49	2.58	3.71	5.78	23.56	.61	22.95	9.00	31.95	1.75	18.3
3	60	13.39	3.43	3.78	7.13	27.73	....	27.73	9.00	36.73	1.88	18.9
4	20	7.94	2.70	3.31	9.72	23.67	3.10	20.57	9.00	29.57	1.90	15.0
5	120	11.02	4.06	2.96	4.98	23.02	.50	22.52	9.00	31.52	2.25	14.0
6	120	10.92	3.62	2.96	4.45	21.95	.74	21.21	6.00	27.21	2.27	12.0
7	60	9.94	2.97	2.07	4.24	19.22	1.50	17.72	7.50	25.22	2.47	10.2
8	80	10.88	3.60	2.22	5.24	21.94	.09	21.85	6.00	27.85	2.54	10.0
9	320	13.53	3.81	2.98	5.61	25.93	.67	25.26	9.00	34.26	2.64	13.0
10	80	11.22	2.75	1.83	5.09	20.89	.79	20.10	7.50	27.60	2.91	9.5
11	140	9.57	3.25	2.13	6.37	21.32	.36	20.96	9.00	29.96	3.09	9.7
12	50	13.35	2.56	2.08	4.36	22.35	.34	22.01	7.50	29.51	3.14	9.4
13	180	9.94	2.63	1.78	6.20	20.55	.50	20.05	7.50	27.55	3.94	7.0
SALINE COUNTY, MO.												
1	90	$8.35	$3.01	$3.39	$5.95	$20.70	$14.89	$5.81	$18.00	$23.81	$1.21	19.7
2	40	9.58	3.67	3.14	6.71	23.10	2.79	20.31	13.50	33.81	1.50	22.5
3	100	15.87	3.86	3.67	7.54	30.94	1.00	29.94	10.80	40.74	1.70	24.0
4	40	7.80	3.12	5.04	3.90	19.86	1.07	18.79	15.00	33.79	1.88	18.0
5	100	13.43	3.48	2.73	4.29	23.93	1.45	22.48	12.00	34.48	1.92	18.0
6	85	16.50	3.49	3.49	5.22	28.70	....	28.70	12.00	40.70	1.94	21.0
7	70	5.53	3.41	5.84	7.09	21.87	1.42	20.45	15.00	35.45	1.97	18.0
8	65	17.84	4.31	6.54	6.48	35.17	1.06	34.11	15.00	49.11	2.16	22.8
9	40	13.18	3.14	2.48	7.44	26.24	....	26.24	9.00	35.24	2.31	15.3

TABLE XXXVII.—*Individual costs per acre on owned land, spring and winter wheat, 1919 (327 farms)*—Continued.

Record number.	Acres harvested.	Factors of cost, per acre.								Total net cost, with rent.		Yield per acre.
		Labor.	Material.	Thrashing.	Miscellaneous.	Total gross cost, without rent.	Credit.	Total net cost, without rent.	Rent (interest on investment).	Per acre.	Per bushel.	
WINTER WHEAT—Continued.												
SALINE COUNTY, MO.—Continued.												
10	$200	$8.58	$2.57	$1.92	$3.66	$16.73	$8.43	$8.30	$16.50	$24.80	$2.32	10.7
11	70	11.03	3.16	2.14	5.49	21.82	....	21.82	15.00	36.82	2.34	15.7
12	65	5.98	3.32	3.28	5.15	17.73	.97	16.76	15.00	31.76	2.80	11.3
13	15	13.73	3.54	3.82	4.30	25.39	.32	25.07	9.00	34.07	2.84	12.0
14	75	14.02	3.29	1.96	4.72	23.99	.83	23.16	15.00	38.16	2.86	13.3
15	175	10.90	3.76	4.29	4.06	23.01	.14	22.87	18.00	40.87	2.92	14.0
16	37	8.29	3.46	1.97	6.59	20.31	4.05	16.26	15.00	31.26	3.04	10.3
17	30	13.96	3.19	2.18	9.64	28.97	4.20	24.77	12.00	36.77	3.11	11.8
18	65	20.32	3.75	1.90	5.22	31.19	.46	30.73	12.00	42.73	3.29	13.0
19	40	14.99	3.54	1.78	19.83	40.14	1.87	38.27	12.00	50.27	3.35	15.0
20	20	14.63	3.26	1.80	4.10	23.79	.30	23.49	13.50	36.99	4.25	8.7
21	40	15.13	3.44	1.50	9.81	29.88	4.06	25.82	12.00	37.82	5.20	7.3
JASPER COUNTY, MO.												
1	52	$13.42	$5.33	$1.67	$4.49	$24.91	$0.78	$24.13	$8.10	$32.23	$1.29	25.0
2	145	10.50	6.18	1.34	6.69	24.71	4.03	20.68	7.80	28.48	1.41	20.2
3	34	14.26	5.00	1.52	4.41	25.19	.82	24.37	6.00	30.37	1.43	21.2
4	68	12.21	4.65	1.53	4.93	23.32	.81	22.51	6.00	28.51	1.52	18.8
5	130	12.93	3.96	1.64	6.42	24.95	.25	24.70	8.40	33.10	1.54	21.5
6	85	9.93	4.65	1.78	5.86	22.22	.52	21.70	9.00	30.70	1.54	20.0
7	17	18.29	7.65	2.03	7.11	35.08	5.29	29.79	9.00	38.79	1.55	25.0
8	55	15.15	4.94	1.54	4.71	26.34	3.00	23.34	9.00	32.34	1.62	20.0
9	140	13.74	5.41	1.55	4.89	25.59	.51	25.08	9.00	34.08	1.66	20.5
10	185	13.97	5.37	1.43	5.45	26.22	2.59	23.63	8.40	32.03	1.70	18.9
11	20	14.84	5.39	1.41	4.65	26.29	.65	25.64	6.00	31.64	1.71	18.5
12	75	15.54	6.67	1.72	5.90	29.83	.64	29.19	9.00	38.19	1.75	21.8
13	70	12.67	5.75	1.32	5.40	25.14	.43	24.71	7.50	32.21	1.79	18.0
14	85	13.55	5.28	1.29	4.32	24.44	1.00	23.44	7.50	30.94	1.85	16.7
15	30	15.84	8.17	1.20	4.51	29.72	5.33	24.39	6.00	30.39	2.07	14.7
16	39	23.90	4.62	1.76	6.73	37.01	....	37.01	9.00	46.01	2.22	20.8
17	39	14.82	4.33	1.27	8.75	29.17	3.08	26.09	7.50	33.59	2.24	15.0
ST. CHARLES COUNTY, MO.												
1	15	$9.48	$3.86	$2.86	$6.76	$22.96	$0.33	$22.63	$12.00	$34.63	$1.15	30.0
2	90	10.18	3.84	2.21	5.28	21.51	.56	20.95	7.50	28.45	1.19	24.0
3	144	12.34	4.21	2.21	4.01	22.77	.14	22.63	8.40	31.03	1.35	22.9
4	67	7.57	3.82	2.14	7.24	20.77	.37	20.40	12.00	32.40	1.39	23.3
5	35	12.73	2.94	2.01	4.16	21.84	.32	21.52	9.00	30.52	1.40	21.8
6	33	15.08	3.61	2.55	4.82	26.06	.42	25.64	13.50	39.14	1.44	27.3
7	52	11.80	3.70	1.81	4.17	21.48	.48	21.00	8.40	29.40	1.48	19.9
8	89	10.93	2.99	1.91	5.04	20.87	.44	20.43	12.00	32.43	1.49	21.7
9	60	13.84	3.25	2.03	5.33	24.45	.83	23.62	9.00	32.62	1.51	21.7
10	105	10.04	3.40	1.76	3.93	19.13	1.19	17.94	10.50	28.44	1.57	18.2
11	36	15.82	3.17	1.93	6.34	27.26	1.22	26.04	8.40	34.44	1.60	21.6
12	90	11.89	3.14	1.86	3.57	20.46	....	20.46	12.00	32.46	1.62	20.0
13	20	12.48	3.55	1.83	4.41	22.27	.46	21.81	10.50	32.31	1.62	20.0
14	80	9.91	4.49	1.77	5.04	21.21	....	21.21	9.00	30.21	1.63	18.5
15	54	13.35	3.53	1.73	5.87	24.48	.58	23.90	7.50	31.40	1.65	19.1
16	23	11.36	3.51	1.73	4.22	20.82	.51	20.31	10.50	30.81	1.69	18.3
17	70	11.73	3.48	2.10	7.52	24.83	.29	24.54	12.00	36.54	1.73	21.1
18	52	15.93	4.09	1.84	5.42	27.28	....	27.28	9.00	36.28	1.80	20.2
19	70	9.45	3.59	1.69	5.21	19.94	.43	19.51	12.00	31.51	1.82	17.3
20	65	18.58	3.87	1.92	6.14	30.51	1.00	29.51	7.50	37.01	1.85	20.0
21	60	12.69	3.89	2.29	7.73	26.60	.50	26.10	18.00	44.10	1.86	23.8
22	110	13.43	3.92	1.89	4.96	24.20	.23	23.97	13.50	37.47	1.87	20.0
23	41	17.19	3.84	1.99	5.96	28.98	.41	28.57	9.00	37.57	1.88	20.0
24	40	18.63	6.69	2.00	6.97	34.29	.75	33.54	7.50	41.04	1.99	20.6
25	40	14.55	4.31	1.98	7.44	28.28	.30	27.98	12.00	39.98	2.00	20.0
26	38	13.12	5.22	1.88	5.41	25.63	.57	25.06	15.00	40.06	2.00	20.0
27	77	14.60	5.01	1.91	5.96	27.48	.52	26.96	15.00	41.96	2.02	20.8
28	55	17.67	4.71	1.77	6.01	30.16	.64	29.52	9.00	38.52	2.06	18.7
29	80	12.36	3.64	1.27	5.16	22.43	.38	22.05	7.50	29.55	2.15	13.8
30	42	14.87	3.32	1.42	5.19	24.80	.65	24.15	9.00	33.15	2.32	14.3
31	180	12.01	4.19	1.29	5.41	22.90	.27	22.63	9.00	31.63	2.48	12.8

TABLE XXXVII.—*Individual costs per acre on owned land, spring and winter wheat, 1919 (327 farms)*—Continued.

Record number.	Acres harvested.	Factors of cost, per acre.								Total net cost, with rent.		Yield per acre.
		Labor.	Material.	Thrashing.	Miscellaneous.	Total gross cost, without rent.	Credit.	Total net cost without rent.	Rent (interest on investment).	Per acre.	Per bushel.	
WINTER WHEAT—Continued.												
PHELPS COUNTY, NEBR.												
1	20	$6.48	$2.50	$0.82	$2.82	$12.62	$1.00	$11.62	$6.00	$17.62	$1.58	8.0
2	20	7.33	3.08	1.38	3.77	15.56	....	15.56	6.00	21.56	1.66	13.0
3	100	8.20	3.86	1.63	4.17	17.86	.14	17.72	7.50	25.22	1.68	15.0
4	235	9.49	2.87	1.53	4.97	18.86	....	18.86	6.90	25.76	1.86	13.8
5	110	9.56	2.82	1.53	4.61	18.52	....	18.52	7.50	26.02	1.86	14.0
6	43	12.30	2.84	1.66	4.34	21.14	....	21.14	7.50	28.64	1.91	15.0
7	80	9.19	3.37	1.20	3.23	16.99	2.50	14.49	6.60	21.09	1.92	11.0
8	430	9.70	2.67	1.28	3.44	17.09	....	17.09	7.50	24.59	2.05	12.0
9	100	8.73	2.65	1.05	4.88	17.31	1.10	16.21	7.50	23.71	2.43	9.8
10	140	9.40	2.60	1.02	3.91	16.93	.48	16.45	7.50	23.95	2.48	9.6
11	120	9.74	3.08	1.06	3.90	17.78	.42	17.36	8.40	25.76	2.69	9.6
12	90	11.22	2.42	.94	3.56	18.14	....	18.14	6.00	24.14	2.76	8.8
13	105	9.09	2.38	.75	3.67	15.89	....	15.89	7.50	23.39	3.11	7.5
14	55	6.38	2.53	.43	5.34	14.68	.42	14.26	9.00	23.26	6.33	3.7
SALINE COUNTY, NEBR.												
1	50	$10.59	$4.36	$1.83	$5.95	$22.73	$0.20	$22.53	$9.00	$31.53	$1.43	22.0
2	55	15.15	4.72	2.86	4.74	27.47	.45	27.02	9.00	36.02	1.61	22.4
3	30	16.44	5.19	2.28	6.47	30.38	2.50	27.88	12.00	39.88	1.69	23.6
4	48	13.30	3.96	2.19	5.43	24.88	.31	24.57	12.00	36.57	1.76	20.8
5	65	10.15	4.55	1.72	6.39	22.81	....	22.81	12.00	34.81	1.93	18.0
6	50	13.33	3.64	1.99	6.97	25.93	.50	25.43	15.00	40.43	1.93	21.0
7	85	12.97	3.38	2.39	5.05	23.79	....	23.79	15.00	38.79	1.94	20.0
8	45	13.42	3.58	1.61	5.49	24.10	.22	23.88	9.00	32.88	2.05	16.0
9	40	11.62	3.58	1.76	3.97	20.93	....	20.93	16.50	37.43	2.08	18.0
10	35	19.16	4.20	1.94	6.03	31.33	....	31.33	10.50	41.83	2.09	20.0
11	50	14.39	3.90	1.80	7.31	27.40	....	27.40	12.00	39.40	2.10	18.8
12	55	16.62	7.03	2.02	8.44	34.11	.82	33.29	15.00	48.29	2.10	23.0
13	40	13.87	3.38	1.85	5.62	24.72	.38	24.34	12.00	36.34	2.14	17.0
14	90	18.51	5.52	2.02	5.04	31.09	.33	30.76	12.00	42.76	2.16	19.8
15	16	17.24	4.07	1.80	4.66	27.77	....	27.77	16.50	44.27	2.21	20.0
16	30	19.11	5.25	1.80	6.33	32.49	.33	32.16	12.00	44.16	2.21	20.0
17	60	13.30	4.22	1.68	5.86	25.06	.40	24.66	12.00	36.66	2.29	16.0
18	15	14.69	3.97	1.75	7.29	27.70	.50	27.20	12.00	39.20	2.31	17.0
19	22	13.43	4.31	1.28	5.46	24.48	.91	23.57	12.00	35.57	2.37	15.0
20	122	11.15	3.90	2.05	6.42	23.52	....	23.52	15.00	38.52	2.49	15.4
21	65	17.58	3.85	1.48	5.87	28.78	1.15	27.63	15.00	42.63	2.51	17.0
22	90	15.73	4.63	1.56	6.02	27.94	.33	27.61	15.00	42.61	2.61	16.3
23	74	21.50	4.31	1.94	9.87	37.62	....	37.62	12.00	49.62	2.64	18.8
24	20	17.27	3.68	1.85	5.85	28.65	.50	28.15	12.00	40.15	2.77	14.5
25	12	17.09	3.38	1.28	6.32	28.07	.42	27.65	12.00	39.65	2.83	14.0
26	50	15.55	5.50	1.08	5.01	27.14	....	27.14	9.00	36.14	3.61	10.0
27	30	14.65	4.34	1.24	5.19	25.42	.20	25.22	14.40	39.62	3.96	10.0
KEITH COUNTY, NEBR.												
1	450	$8.09	$1.56	$2.07	$4.04	$15.76	$0.44	$15.32	$3.90	$19.22	$0.96	20.0
2	130	13.02	2.14	2.94	5.18	23.28	.35	22.93	5.40	28.33	1.01	28.0
3	65	11.94	2.23	2.61	8.33	25.11	.23	24.88	4.80	29.68	1.19	25.0
4	150	8.24	2.77	2.49	9.65	23.15	.06	23.09	8.40	31.49	1.35	23.3
5	60	12.64	2.20	1.96	4.86	21.66	.34	21.32	4.50	25.82	1.37	18.8
6	60	7.53	2.20	1.44	5.41	16.58	.10	16.48	6.00	22.48	1.50	15.0
7	100	7.32	2.00	1.22	2.74	13.28	....	13.28	6.00	19.28	1.57	12.2
8	65	9.29	2.98	2.05	6.45	20.77	....	20.77	7.50	28.27	1.60	17.5
9	100	11.69	2.83	1.69	4.88	21.09	.25	20.84	6.00	26.84	1.68	16.0
10	40	13.86	2.50	1.60	3.40	21.36	....	21.36	6.00	27.36	1.82	15.0
11	65	12.06	2.49	1.41	5.31	21.27	.31	20.96	7.50	28.46	1.99	14.3
12	200	5.44	2.25	1.11	4.84	13.64	....	13.64	6.00	19.64	2.00	9.8
13	20	15.07	2.50	1.09	4.02	22.68	.25	22.43	2.40	24.83	3.08	8.0

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